


35p 9-15 February 1984 Vol 3 No 6

## This Week




★STAR
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See page 10.
GAME★


## News Desk

# Japanese invasion is almost here

THE Japanese micro invasion — eight machines, (six pictured here), all running the same MSX operating system and software — is almost here.

The computers — from Sony, Yamaha, Canon, Fujitsu, Sanyo, Pioneer, Toshiba and National — were paraded before the major retailers last week, prior to their arrival in the UK. All of the machines are now on sale in Japan and are shortly to be launched in the US.

The UK versions — adapted to work with our own PAL TV system — now seem quite likely to appear in the Autumn, all priced around £200.

As well as being shown to the buyers from the high street chains, six of the machines were also brought together so that a major European manufacturer — Philips — could finalise details of its own micro entry, also adopting the MSX standard.

continued on page 5

**MSX clones, clockwise from bottom left: Sony Hit-Bit, National CF2000, Toshiba Pasopia IQ, Yamaha YIS503, Fujitsu FM-X and Canon V 10**

# Microchip recedes at toy fair

THE most remarkable aspect of the 1984 British Toy and Hobby Fair, held at Earl's Court last week, — was its lack of micros.

The previous year's show had seen moves from a number of toy companies into home computers. But in 1984 most of them have given up and gone back to concentrating on more traditional toys. Indeed, in all types of toys the micro chip seems to be receding rather than advancing.

Among the casualties were Mettoy, who went into liquidation last year, and Mattel whose impressive stand showed only Barbie dolls and hot wheels. Last year's toy fair saw new micros from Video Technology, Creativision and Tomy, none of which were in evidence last week.

However, the tiny collection of computer firms in one corner of the ball each had something interesting to show.

CBS Electronics displayed

continued on page 5



9/15 February 1984 Vol 3 No 6

SUNSHINE

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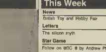
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## This Week





## Editorial

Board games are catching up with the micro revolution An increasing number of software houses are now marketing computer versions of popular board games

The most successful example so far has been Psion's version of *Scrabble* with its 11,000 word vocabulary It plays a good game and is difficult to beat, though it is possible to cheat

There are innumerable versions of chess, draughts, bridge and other card games Now games such as *Cluedo Mastermind, Go, Kensington* and *Mah-Jong* are starting to appear

Many board game companies originally regarded the advent of home computers as a threat to their livelihood However, they are now realising that their ownership of the copyright of many of these games is enabling them to move into new markets, rather than being shut out of old ones Consequently, companies such as Waddingtons and Leisure Genius are either concluding licencing deals with established software houses, or they are recruiting their own in-house teams of programmers

The time is fast approaching when new games will be released simultaneously on boards and on computers But I doubt if micros will ever totally supersede dice, cards and boards — there is somehow more satisfaction in winning on a physical board

## Next Thursday

**Next week's star game is Z Fred — a version of Q-Bert — for 48K Spectrum by Nicky King.**

## Toy fair

continued from page 1

MSX is a detailed machine specification adopted by the seven Japanese manufacturers designed to solve the continual its Expansion Medale 3 for the Colecovision games machine turning it into an Adam computer

Activision announced it will produce a range of software titles for the Commodore 64 (by March, on cartridge) and Spectrum (by April, on cassette)

Atari showed software for the Spectrum and Commodore 64 for the first time — produced by Atarisoft

CGL, which markets the Sord M5 computer announced a deal to market Hobby Robot's RB5X robot The RB5X, which has an on-board computer, 24k Ram, eight touch bumpers and an ultrasonic detector, talks to an Apple computer in Basic through an RS232 interface Its UK price will be around £2,500

Leisure Genius announced a computer version of the board-game *Kensington* to be developed for the Spectrum and Commodore 64 computers

## Invasion

continued from page 1

problem of software incompatibility By making all the machines broadly the same, MSX cassette, cartridge and disc software will run on any MSX machine The idea is the brainchild of Microsoft's Japanese subsidiary — all the machines will run a version of Microsoft Basic (MSX Basic) and MSDos

Each MSX machine will be Z80-based (running at 3.6MHz) with 32k Rom and 64k Ram of which typically 28.5k is available in Basic Display is 32 x 24 characters with 16 colours and a high-resolution graphics mode of 256 x 192 pixels Each micro will have three-channel sound over eight octaves

Provision is made for twin joystick ports, a Rom cartridge port and a parallel printer interface

To maintain software compatibility across the MSX machines, the memory maps are the same, as are the details of the external expansion bus and disc interface All MSX machines have 10 function keys

The MSX specification leaves very little to be decided by the individual manufacturer except the external styling

The Sony Hit Bit is the only machine not to feature a 'professional' quality keyboard. The Yamaha YIS 503 offers an add-on music synthesiser and music keyboard option The Sanyo can be used with a video recorder and can capture video frames from tape or off air The Pioneer machine is designed to fit in a racked system together with a hi-fi The National CF2000 has twin Rom cartridge slots And only the Canon V10 and Yamaha YIS 503 have printer interfaces included as standard

# Turtle for CBM Logo

VALIENT Designs is a new company which has developed, in conjunction with Commodore UK, a turtle to work with Commodore Logo

The device is controlled from a Commodore 64 computer via an infra-red link, which has a range of 20 feet

The Valient Turtle has a pen holder so that the Logo graphics routines written on the micro can be drawn out by the device on a sheet of paper

Other versions of the turtle are under development for the Research Machines, BBC, Apple and Atari computers Disc software supplied with the turtle is designed to be compatible with versions of Logo written by Terepin, Krell and LCSI

The turtle, infra-red communicator and interface package will be priced at £160 with substantial educational discounts for schools

Details from Valient Designs, Unit 14, Park House, 140 Battersea Park Road London SW11

● The Commodore 64 version of Logo — written by Terrapin — is now available, coinciding with the company's cut-price 64's offer to schools

## Commodore executives depart

SINCE the resignation of Commodore's founder Jack Tramiel as president and chief executive of the company four weeks ago, four other top executives have also departed

They are Donald Richard, acting president of Commodore US, Myrrdin Jones, marketing vice-president Bill Miller, systems engineering director and Roy Thomas, manufacturing director

Commodore's shares have also tumbled since Tramiel's departure By the end of last week they stood at $36, down $6

## Telecom goes into space

AS a departure from its usual information services, like the weather and recipe for the day, British Telecom has introduced *Spaceline* — a new service covering the latest developments in space

The weekly bulletin is prepared by Dr David Whitehouse — a leading scientist who has worked with NASA — and is intended to include both up to date news reports as well as more general items on astronomy

The telephone number to ring for the service, which this week is concentrating on the Challenger Space Shuttle, is 01-246 8055

## Choice of databases

COMMODORE 64 owners will soon have a choice of telephone database services to join

Micronet 800, the Prism/Prestel joint venture plans to produce a Commodore 64 modem in the spring, while Commodore has now decided to go ahead with a plan to provide its own system — Compunet

Compunet will only be for 64 owners and Commodore will sell its own modem for around £100 by the summer Compunet will be linked to other databases, like *The Source* in the US, and will also offer facilities like teleshopping and telesoftware No subscription will be charged although there will be a connection charge between certain hours and a fee for downloading certain software titles

## New titles from Quicksilva

AMONG five new software titles announced by Quicksilva is *The Snowman* based on the best-selling book by Raymond Briggs

In the game, for the 48K Spectrum, you must guide a small boy in constructing a snowman, gathering together the snow, his tie glasses trousers, torch, skateboard and balloons

Raymond Briggs has written a number of successful books including *Fungus the Bogeyman* and *When the Wind Blows*

The other Quicksilva programs are *Laser Zone* (from the Jeff Minter title), *Fred* a maze game and *Dragonsbane* a graphic adventure, all for the 48K Spectrum, and *Sting* for the Commodore 64



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TRADE ENQUIRIES WELCOME
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NEW
NEW

## Top of the league

I am writing in response to a letter sent in by Peter May of Kent to the *Peek & Poke* section of *Popular Computing Weekly* 19-25 January

I think your readers may be interested to know that Addictive Games will be producing a Commodore 64 version of *Football Manager* and we will also be producing versions for the BBC Micro, the Oric, the Dragon 32, the Vic20 and other popular micros We intend to release the BBC version during February, with others to follow

*Kevin Toms*
*Addictive Games*
*7a Richmond Hill*
*Bournemouth BH2 6HE*

## The silicon myth

I have owned a computer for over a year now and have come to a conclusion which many of your readers will probably disagree with most strongly The conclusion is this I and others have been conned I shall explain

After the initial excitement of owning a computer had worn off, I began to think what possible practical use it could be put to Sure, it played games — very colourful and very sophisticated some of them Well they have to be The demand for new and exciting games is created not only by software companies offering us more earth-shattering, mind-blowing games, but by the public themselves who buy them because they don't want to be reminded that they've spent a small fortune on something that does nothing They're escaping from the reality that they've been conned And who by?

But, to get back to my question what does it do? I suppose I could buy a gadget that would enable my computer to talk Probably spending long programming hours building up a small vocabulary so that the computer can utter a few meaningless words or phrases So what? It may amaze and amuse a couple of friends, but what would soon wear off It can print I can spend well over £200 on a printer, but unless I'm in business or have a job that requires one, what would be its use? To print out a computer program? That's very useful

It can run an electric train Oooh, that's something to look forward to I'll go and buy one!

Its most useful application is to occupy bored minds I spend hours blasting silly little aliens that make pathetic noises when destroyed I move objects around the screen in 3D (WOW) I have a filing system which is capable of finding an item at light speed But, by the time I have set the damn thing up and loaded the program, I could have already found it in half the time!

The thing that gets me is that no one is prepared to tell the truth People are too frightened And it's not surprising Huge businesses have been built up on the back of the Silicon myth, and many more are being born every week

Papers, television and in particular computer magazines, help perpetuate the myth that computers are wonderful and fantastic — there's nothing they can't do because their very existence relies on the public buying them And, because magazines depend heavily on computer companies' advertising revenue, they are in a sense the companies' mouthpieces

The magazines do not dare to criticize or question the usefulness or contribution of computers to society Instead, the magazines are intent on stoking the furnace of a consumer public, which are demanding more and more, because they are told by the magazines and the rest of the media, that they can't live without a computer

The whole thing is a massive con trick A home computer is one of the most useless consumer commodities invented

My advice to anyone teetering on the edge of buying a computer is think All it can do is play games, talk a bit and, if you can afford it, print a bit Nothing else It won't make you clever or wise And if you believed half of what those mono-sodium-glutamate-glossy adds said, you would be capable of running the world's individual companies and still have change to play a game of *Scrabble*

*John Wheatley*
*29 Hansler Rd*
*E Dulwich*
*London SE22*

**Conned, huh? A gigantic conspiracy to hide the grim truth that computers don't actually do anything! Well, you may not agree with it, but you must admit it's a heck of a theory.**

## Halls of the Things

I would like to point out a couple of features which as far as I know, haven't been discovered yet about *Halls of the Things* by Crystal

First of all, it is possible to open the lower door without getting all of the rings (ie, for those who would like a sneak preview) and secondly for those of you using black and white tv's, it is possible to turn the whole display into black and white

To get the bottom door open, just press 2 then press space And to get the black and white display, press *W* then press space and to get the colour display back press *W* then space again

On my colour tv I get a better picture with Psion's *Flight Simulation* if I change line 1 to read·

```
10 Border 0   Paper 5  Ink 1   CLS
```

but the paper and ink can be changed to

```
Paper 1  Ink 4  to give green ground and blue sky
```

Finally can anyone tell me if there is any way of saving a *Screens* without clearing the bottom two lines?

*Peter J Moss*
*3 Bernshall Crescent*
*Ecclesfield*
*Shefield S5 9FB*

## The latest victim

It's debug time again! The latest victim being Roy Masefield's program on Newton's laws of motion (*PCW*, 12-18 January)

He quotes three standard formulae concerning motion with constant acceleration and then the program manipulates them However, he clearly states that given final velocity, distance and time, the equations are impossible to solve

Wrong Or, if correct only so because he's left out the fourth of the standard formulae pertaining to constant acceleration, ie

```
s = ½(U + v) t
```

Include this with the three equations he has used already and all relevant problems can be solved Necessary changes to the program

(a) Delete the Health Warning "(except — Time)" from line 20

(b) Change line 260 to

```
260 GOSUB 595   GOSUB 580
```

and add in

```
265 GOSUB 710  GOSUB 760  GOTO 400
595 LET u = 2* s/t - v   RETURN
```

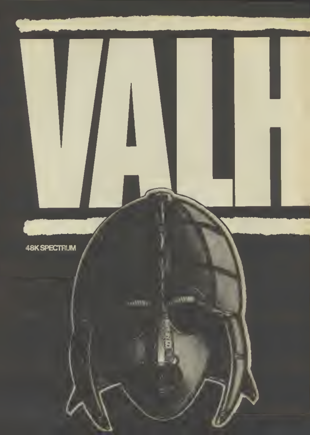
Then it works perfectly

Fancy That Dept Galileo had published all this before Newton was born Newton's achievement was to generalise it all to the case when the force and acceleration aren't constant

Requiem on the Spectrum machine code series In the immortal words of Tom Lehrer More! More! I'm still not satisfied!

*Jim Hind*
*5 Park Street*
*Southend*
*Essex SS0 7PA*

**Your wish, etc, etc. If you look at the Spectrum page in this week's issue, you will find a follow up to our last code series.**


VALH
48K SPECTRUM

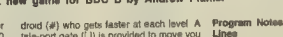
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MOVISOFT





# Follow



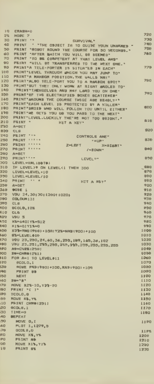
**A new game for BBC B by Andrew Pfahler**

The object of this game is to guide your unarmed robot around the screen for 50 seconds, avoiding the deadly red blocks. All the time you are being followed by a red droid (#) who gets faster at each level. A tele-port gate ([ ]) is provided to move you to a random point on the screen if you can reach it.

This program was written for the BBC model B

### Program Notes

| Lines | |
|---|---|
| 20–210 | Sets the scene |
| 220–270 | Gives the instructions |
| 280–330 | Sets the skill level |
| 360–630 | Sets variables etc |
| 640–1000 | Controls game |
| 1020–1100 | Successful level control |
| 1110–1240 | Unsuccessful level control |



```
10  CRASH=0
20  MODE 7
30  PRINT ''"                 SURVIVAL"
40  PRINT '' "THE OBJECT IS TO GUIDE YOUR UNARMED "
50  PRINT "ROBOT ROUND THE COURSE FOR 50 SECONDS."
60  PRINT "AFTER WHICH YOU WILL BE DEEMED"
70  PRINT "TO BE COMPETENT AT THAT LEVEL AND"
80  PRINT "WILL BE TRANSFERRED TO THE NEXT ONE."
90  PRINT"A TELE-PORTER IS SITUATED IN EACH"
100 PRINT"LEVEL THROUGH WHICH YOU MAY JUMP TO"
110 PRINT"A RANDOM POSITION.THE WALLS MAY"
120 PRINT"ALSO TELE-PORT YOU TO A RANDOM SPOT"
130 PRINT"BUT THEY ONLY WORK AT RIGHT ANGLES TO"
140  PRINT"THEMSELVES AND MAY LAND YOU ON ONE"
150 PRINT"OF THE ELECTRIFIED BOXES SCATTERED"
160 PRINT"AROUND THE COURSE THESE ARE DEADLY!"
170 PRINT"EACH LEVEL IS PROTECTED BY A KILLER"
180 PRINT"DROID WHO WILL FOLLOW YOU UNTIL EITHER"
190 PRINT"HE GETS YOU OR YOU PASS TO THE NEXT"
200 PRINT"LEVEL.LUCKILY THEY'RE NOT TOO BRIGHT."
210 PRINT "            HIT A KEY"
220 A=GET
230 CLS
240 PRINT '''"                 CONTROLS ARE"
250 PRINT '''''"                    *=UP"
260 PRINT '''''"             Z=LEFT        X=RIGHT"
270 PRINT '''''"                   /=DOWN"
280 A=GET
290 PRINT''''"                 LEVEL?"
300 LEVEL=VAL(GET$)
310 IF LEVEL>9 ON LEVEL<1 THEN 300
320 LEVEL=LEVEL+10
330 LEVEL=LEVEL/10
340 PRINT  '' "               HIT A KEY"
350 A=GET
360 MODE 1
370 VDU 24,30;30;1200;1020;
380 COLOUR131
390 CLS
400 GCOL0,128
410 CLG
420 VDU 5
430 X%=640:Y%=512
440 X1%=0:Y1%=0
450 X2%=RND(900)+100:Y2%=RND(900)+100
460 S%=LEVEL*10
470 VDU 23,250,24,60,36,255,189,165,36,102
480 VDU 23,251,255,255,255,255,255,255,255,255
490 A$=CHR$(250)
500 B$=CHR$(251)
510 FOR A=1 TO LEVEL*11
520   GCOL0,1
530   MOVE RND(900)+100,RND(900)+100
540   PRINT B$
550   NEXT
560 B$="#"
570 MOVE X2%-10,Y2%-20
580 PRINT "[ ]"
590 GCOL0,0
600 MOVE X%,Y%
610 PRINT CHR$(251)
620 GCOL0,1
630 TIME=0
640 REPEAT
650   MOVE 0,I
660   PLOT 1,1279,0
670   GCOL0,0
680   MOVE X%,Y%
690   PRINT A$
700   MOVE X1%,Y1%
710   PRINT B%
720   MOVE X2%-10,Y2%-10
730   PRINT "[ ]"
740   GCOL0,1
750   *FX 21,0
760   IF INKEY(-73) THEN Y%=Y%+25:SOUND 0,-15,2,1
      IF Y%>1020 THEN Y%=RND(900)+100:SOUND 0,-10,3,
      1:GOTO 800
770   IF INKEY(-105) THEN Y%=Y%-25:SOUND 0,-15,2,1
      IF Y%<40 THEN Y%=RND(900)+100:SOUND 0,-10,3,
      1:GOTO 800
780   IF INKEY(-98) THEN X%=X%-25:SOUND 0,-15,2,1:
      IF X%<50 THEN X%=RND(900)+100:SOUND 0,-10,3,1
      GOTO 800
790   IF INKEY(-67) THEN X%=X%+25:SOUND 0,-15,2,1:
      IF X%>1170 THEN X%=RND(900)+100:SOUND 0,-10,
      3,1:GOTO 800
800   IF X%>X2% AND X%<X2%+40 AND Y%<Y2% AND
      Y%>Y2%-40 THEN X%=RND(900)+100:Y%=RND(900)+
      100:GCOL0,0:MOVE X%,Y%:PRINT CHR$(252):GCOL0,1
810   IF POINT(X%,Y%)<>0 AND POINT(X%,Y%)<>3
      THEN CRASH=1
820   IF POINT(X%,Y%-30)<>0 AND POINT(X%,Y%-30)<>3
      THEN CRASH=1
830   IF POINT(X%+15,Y%)<>0 ANDPOINT(X%+15,Y%)<>3
      THEN CRASH=1
840   IF POINT(X%+15,Y%-30)<>0 AND POINT(X%+15,
      Y%-30)<>3 THEN CRASH=1
850   IF X1%>X%-(S%-1) AND X1%<X%+(S%-1) AND
      Y1%<Y%+(S%-1) AND Y1%>Y%-(S%-1) THEN CRASH=1
860   IF X1%>X% THEN X1%=X1%-S%
870   IF X1%<X% THEN X1%=X1%+S%
880   IF Y1%<Y% THEN Y1%=Y1%+S%
890   IF Y1%>Y% THEN Y1%=Y1%-S%
900   MOVE X%,Y%
910   GCOL0,2
920   PRINT A$
930   MOVE X1%,Y1%
940   GCOL0,1
950    PRINT B%
960   MOVE X2%-10,Y2%-20
970   GCOL0,3
980   PRINT "[ ]"
990   GCOL0,1
1000  UNTIL CRASH=1 ON TIME/100>50
1010 IF CRASH=1 THEN 1110
1020 MODE 7
1030 PRINT TAB(10,10)"LEVEL COMPLETE"
1040 PRINT TAB(10,15)"NEXT LEVEL"
1050 PRINT TAB(10,17)"BE READY"
1060 S%=S%+2
1070 TIME=0:T=RND(600)
1080 REPEAT:UNTIL T<TIME
1090 LEVEL=LEVEL+0.3
1100 GOTO 360
1110 SOUND 0,-10,5,10
1120 MODE 7
1130  PRINT TAB(15,10)"YOU'RE DEAD"
1140 PRINT TAB(3,12)"YOU DIDN'T SURVIVE LONG ENOUGH"
1150 PRINTTAB(12,14)"YOU SURVIVED FOR"
1160 PRINTTAB(6,16)TIME DIV 100;"SECONDS"
1170 PRINTTAB(15,18)"AT LEVEL";LEVEL*10-10
1180  IF LEVEL*10-10>10 AND LEVEL*10-10<20 PRINT "
     NOT TOO BAD"
1190  IF LEVEL*10-10>20 AND LEVEL*10-10<50 PRINT "
     FAIRLY GOOD"
1195 IF LEVEL*10-10>50 THEN PRINT " FAR OUT"
1200 A=GET
1210 *FX21,0
1220 CRASH=0
1230 GOTO250
```



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# Electric avenue

**David Kelly** *talks to Alan Rawlinson from the Family Leisure Centre*

The Family Leisure Centre in Old Compton Street London is one of a chain of seven successful West End amusement arcades operated by Alan Rawlinson.

His office is a cramped prefabricated room beneath the Old Compton Street premises. For company, he has a phone which rings continually.

A likeable but rather shy individual Alan was uncertain what to make of this interview. Being a purveyor of one-arm bandits — or their modern equivalent — he is accustomed to receiving a hostile press.

"There was a time," he says, "when any trouble or punch-up was blamed on us. Since video games like *Space Invaders* though, people seem to have come to accept the arcades more."

The microchip has revolutionised the coin-operated machine industry with electronically operated games taking over. In the Old Compton Street arcade there is now only one of the old electro-mechanical machines — a life size model of a Western gunfighter. The microprocessor has beaten the other machines to the draw.

Traditional fruit machines were the first to succumb, more than eight years ago. Instead of the drums spinning randomly a micro generates a random number and chooses the winning line at the instant the player presses the start button.

Then came the first video games — the *Pong* tennis game, Alan's driving game *GT-10* and the big one — *Space Invaders*. "There has never been a game as successful as *Space Invaders* was between 1974 and 1975. At its peak we had one arcade with 30 identical machines. The maximum number of the same game you ever get in one arcade now is about four."

The incredible success of *Space Invaders* was a hard act to follow and to date, no other game has even come close to equalling its popularity.

*Asteroids* was the next big game followed quickly by *Galaxians*, which was the first video game with a colour display screen. Then came *Centipede* and driving games like *Monaco* and the more recent *Pole Position*.

Alan has always viewed video games as 'novelty' games, classing them alongside the electro-mechanical Jesse James. The bread-and-butter of an arcade has always been the fruit machines. "Even at their peak, video games only equalled the slot machines. Then about 50 percent of my machines were novelty games — the figure is now down to around 10 percent.

"This is about the same as the number of the old electro-mechanical novelty games we had before video games existed." He is sure home computers are partly responsible for the drop in video game popularity — if people can play the games at home then they don't need to come to the arcades.

"The first home computer games were so inferior to the arcade versions that none of the arcade manufacturers took much notice. Some of the systems I have seen now — there is hardly any difference."

Possibly a costly mistake on the video machine company's part — only two weeks ago the only UK arcade company — Century Electronics — went into liquidation. And only very recently have arcade companies begun to think about licencing their games for home computers — like Sega with *Frogger*.

Earnings from a video game machine usually drop off quite markedly after the first eight weeks. To break even a machine has to bring in around £1500 in two months. "With the decline in video game popularity the machines have become almost a liability. Most smaller town high-street arcades have taken out their video machines."

A similar video game slump has afflicted the American arcades and one idea to get things moving again has been laser disc based video games. On the face of it, they sound very exciting — the player controls the sequence of a Disney-type cartoon or video of a race. Rather like being one of the characters in a film, actually influencing the course of the plot.

In the US these laser-disc games have been very successful — notably titles like *Astron Belt* (the first laser game) and *Dragon's Lair* (a cartoon drawn by an ex-Disney artist). Over here, however, their performance has been rather disappointing.

"If you compare them with a top printed-circuit board game like *Star Wars* or *Pole Position* they may be as good — they are no better."

Alan reckons there are two reasons for this. Most people find laser-disc games confusing at first. Often the action is very discontinuous with blanks on screen as the system searches the laser-disc for the next section of the game.

Also, US arcades are not allowed to have slot machines — gambling is restricted to just a couple of states. As a result, the video game slump really hurt. Whereas the UK arcades simply pulled out the videos and put in more fruit machines, their US equivalents were shutting down *en masse*. The laser disc games were greeted as the saviour of the US arcades and Alan feels the US success of the machines has been exaggerated.

Other problems with operating laser-disc games are cost — around double that of buying an ordinary video game, and maintenance — the laser-disc technology is not well suited to continuous use in a commercial environment. Some laser-disc units spin the disc at over 1,800 rpm.

"To try to make the action continuous they are now talking of speeding the disc up even further!

"All of these problems at the moment put a laser-disc game out of the reach of the small high street arcade.

"The latest idea is to use a film of someone like Daley Thompson and you have to compete with him in the Olympics which sounds very interesting.

"But I still don't see laser games becoming hugely successful. If anything the whole video games industry is settling down.

"There is another generation of customers coming in now and the video game has properly become part of arcade life.

"Right now the hit games are *Star Wars* and *Track and Field*. Also *Pole Position* still keeps on going. All the other games have settled down at a much lower income. We also have *Crossbow* — a new shooting game — which looks like it is going to be strong."

As to the future Alan points to two innovations. A system has been developed to play from a laser disc into computer Ram memory — which could possibly eliminate the biggest problems with laser disc games — that of discontinuity of play.

The other appeals much more to Alan and takes its cue — rather surprisingly — from home computers. A Japanese company Data East has developed a cassette-based arcade machine. The arcade buys one machine and loads in different games from cassette.

"With games having such a short active life it is an obvious way to go and it gets round the biggest problem for arcades — that of expense. Why have a video game in the arcade when it costs half as much again as a slot machine and has a much shorter life?"

## REVIEW

# Food for thought

*Tony Kendle is pursued by gastronomic ghouls in this round-up of Spectrum software*

I always find the New Releases pages of *PCW* disturbing in the extreme There can be no doubt that the ranks of Spectrum software are swelling faster than most people's bank accounts can tolerate and with the quality of the games improving all the time making a choice becomes harder and harder (remember the old days when everyone you knew had a copy of *Hungry Horace?*) However, there are some games that will inevitably stand out from the crowd

Foremost amongst these are the offerings from Ultimate, this company must receive the credit for rewriting the definition of Spectrum arcade software and it would be difficult to match their quality This is shown to full advantage in the new 48K sequel to *Jetpac* called *Lunar Jetman*

Although at the time it came out I said it couldn t be bettered *Jetpac's* graphics look poor alongside those of *Lunar Jetman,* especially the design of the attacking aliens and the superb lunar rover The new game offers the same central protagonist — a hovering spaceman — but the object of the game is much more complex and involves many more features to test skill

The idea is that you are in your rover, travelling the surface of an alien planet looking for bombs laser gun turrets or other such peraphanalia with which to equip your craft These can later be used to destroy the enemy missile bases which are dotted about the planet. Added to your problems are the various craters that impede the passage of your rover and must be filled in, at great personal risk, before you can proceed

The problem is that when killed by the fast and furious aliens, as you inevitably are rather than vanishing in a puff of smoke as in *Jetpac* you are dramatically blown across the screen leaving more and bigger craters where you land

This is the one criticism I could make of this game — it scores low on initial playability Although there must be lots to see and do in a 48K game my copy could probably have been written in 5K for the amount I survive long enough to enjoy In the end I resorted to cowering inside my rover, hiding from the aliens until my turn ran out and a missile spelt my colourful demise (yes *Lunar Jetman* has both a time and a fuel limit to add to the difficulty so all you *Jetpac* hi-score cheats who stood in one spot blasting away are in for a hard time) Despite being fiendishly difficult to play this is a program that you would be crazy not to buy

*Mr Wimpy* is one of the latest "arcade favourite" conversions offered by Ocean Software Ocean have lately had considerable success with their version of *Donkey Kong* which seems to be the one that stands out from the huge ranks of the competition *Mr Wimpy* is based on the possibly less well known game of *Burger-time* and graphicly at least is a satisfying imitation of the original considering the limitations of the Spectrum

The object of the game is to charge your man up and down ladders and over the various ingredients of some huge hamburgers which then bounce down the screen Gradually the ingredients collect at the bottom as four complete burgers and you are then faced with a new harder screen

Of course it is not all as easy as it sounds because you are constantly pursued by highly malevolent spoons fried eggs and frankfurters (and I am happy to say that the loopy running motion of the latter which was one of the funniest things I have seen on an arcade game, has been reasonably well reproduced) Your only protection from the gastronomic ghouls is to squash them in the burgers or to hurl pepper at them and there is a limited amount of this useful condiment on each screen

The most contentious aspect of *Mr Wimpy* is the opening level which is unrelated to the original game Here you have to collect the various ingredients for your hamburger by chasing from one side of the screen to the other avoiding mobile man-eating manholes There is also a grinning bug called Waldo who is harmless aside from stealing whatever you are carrying thereby forcing you back to the start

The holes are relatively easy to avoid and thus it should only be a matter of time before you collect all the necessary objects, but in reality you become so frustrated by Waldo s kleptomania that you make rash moves and are lucky to reach the following levels with many lives left

I for one would happily sacrifice three of my five lives for a chance to blast Waldo apart with a laser but after long deliberation I decided that the challenge does add to an already enjoyable game My only regret is that if a game ever needed the wonderful music of the arcade original then *Mr Wimpy* is it although you are treated to an occasional rendition of the Wimpy advert theme

*Scuba Dive* from Durell is a game I thoroughly enjoyed because of the superb graphics and animation The plot is extremely simple — you play the title role and your task is to swim the depths of the ocean collecting pearls from oysters as they open and close on the sea bed To complicate things you have to keep an eye on your oxygen levels and return all treasure to your boat on the surface before you score any points at all this does require discipline and skill

The real enjoyment comes from avoiding the teeming sea-life such as giant squids and great white sharks if you are skilful you can sneak past an octopus into lower caverns where you will find giant clams treasure chests and an even more spectacular range of marine life

My only worry is that the game itself is far from earthshaking in concept and once you get the hang of avoiding the clams and other man-eaters there seems to be little progress to be made except in terms of the score This suspicion appears to be confirmed by the fact that you are given a facility for saving and loading your previous hi-score charts

But having said that, in our house the game was constantly being loaded in, even if it was for short periods at a time, and if you think it s the kind of thing you will enjoy then you could not find a better written programme than this If you do tire of it you can always leave the wonderfully animated title screen running — it s better than a goldfish bowl

In contrast *Jumbly* from Dk'Tronics presents such a challenge that it almost

becomes demoralising, although that does not detract from another superb piece of programming. Do you remember those small slider puzzles that consist of a picture or a set of words made up of lots of small interlocking squares with one missing — the idea being to jumble the square up and then try to rearrange them in the correct order. Well, *Jumbly* is based on the same principle, but is made fiendishly difficult because the ten pictures are not only complex but also animated and continue to move after they have been mixed up.

I failed miserably with my first attempts at the initial screen which was a relatively easy alphabet puzzle. Successful completion of each picture within the preset target number of moves, gives you a title to type in and you can then proceed to the next level. I ended up thanking the kind soul who sent a list of the titles with the review copy else it would have taken me months or years to see all ten screens. I have completely the wrong kind of temperament for this game, but for those of you who like traditional puzzles it is indispensible.

To add to the incentive, completing all screens gives you a codeword allowing you to enter a competition to design a picture for *Jumbly II*, thereby winning £150. Incidentally, each screen is accompanied by appropriately wacky and vaguely pertinent music which can, thankfully, be turned off once frustration reaches danger point.

*Space Station Zebra* from Beyond Software comes with a very well designed and presented cassette inlay — reminiscent of their colour adverts you may have seen. The game itself also has a reasonably high standard of professionalism with nicely defined graphics and smooth movement.

The scenario is a rotating space station under attack from oncoming solo aliens which you first locate on the long range scanner. Keeping a close eye on your energy and shield levels, you then try to "shoot-em-up" with your two laser beams by controlling vertical and horizontal sights.

Some of you may now be thinking that this sounds a bit familiar and it is — the game constantly reminded me of *3D Timegate*, although it was thankfully free of interminable screens of opening blurb. *Timegate* was innovative in many ways and although I feel the graphics of *Space Station Zebra* are an improvement, I found Zebra much harder to play successfully and there seemed to be less to look forward to with no planets to land on or attack.

However, for those of you looking for this type of game it is very well produced despite lacking great originality, and a look at the picture of a typical screen on the cassette inlay will give you a good idea of what you will receive.

I flinched when I read the cassette blurb for *Double Trouble* from Starlite — The Key To Entertainment, because I'm getting very tired of twee puns on Clive Sinclair and the Spectrum. In this case you have to protect the "potty pedestrians" of Spectrumville from killer cars on the Sinclair Road. Unfortunately, the program lived up to this initial bad impression which was a huge disappointment as I usually enjoy 'painter' style games.

The potty pedestrians are a static graphic of a loving couple around which you, as Tarmac Tim, have to paint double yellow lines. You are awarded points for the number of lines you manage to paint and at the end of the shift you receive a bonus for the number of pedestrians still alive.

Playing the game was confusing and erratic and success depended more on the random placing of the cars and couples than any skills of your own. The cars moved in a very jerky way, despite being "100% machine code arcade action", and had the ability to knock down Tim from a good centimetre's distance.

To add to the disillusionment, I played several games where I lost all of my lives instantaneously due to a random placing of one of the cars right where you stand at the beginning. Also I suspect that the ability of the cars to wrap around the screen whilst you cannot caused the occasional inexplicable demise of my character at other times.

I'm afraid that this game is prone to these irritating bugs and simply does not stand up against the standard of the competition, in fact it is not much better than you could get from any good magazine listing.

So in summary, there are some excellent games appearing now for the Spectrum, but there still seems to be room for the substandard attempts. The best advice is to ignore what the cassette inlay claims and try to find a specialist shop that will let you see what you are buying — for a typical price of £6 a game that is not too much to ask. ■

| Firm | Program | Price | Value (1-10) |
|---|---|---|---|
| Ultimate<br>The Green<br>Ashby-de-la-Zouch<br>Leics | *Lunar Jetman* | £5 50 | 9 |
| Ocean Software<br>Ralli Building<br>Stanley Street<br>Manchester M35FD | *Mr Wimpy* | £5 90 | 8 |
| Durell Software<br>Castle Lodge<br>Castle Green<br>Taunton<br>Somerset TA1 4AB | *Scuba Dive* | £5 50 | 8 |
| Dk'Tronics<br>Unit 6<br>Shire Hill<br>Industrial Estate<br>Saffron Walden<br>Essex | *Jumbly* | £6 95 | 8 |
| Beyond Competition House<br>Farndon Road<br>Market Harborough<br>Leics | *Space Station Zebra* | £8 65 | 7 |
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PCW3/4

# The missing Lynx

*Clive Newton dissects a few bugs lurking in the Lynx keyboard*

Owners of Lynx micros will probably have discovered a couple of quirks in the Rom particularly in the keyboard scanning routine

The major problem is that the computer encodes the @ key and the order in which the @ and ⌂ characters are encoded, depending on whether you are in shift-lock

The keyboard scan routine is located in the Rom at address 2907, the address pointed to by the system variable 25092/93 The routine has three tables which are used to obtain the necessary character codes depending on whether you are in shift lock or not, or are using keys in connection with the *CONTROL* key It is these tables that are at fault in respect to the square bracket keys

The quirk with the @ key is due to the way the Lynx deciphers which code to return when not in the shift-lock mode The scanning routine has apparently been designed assuming shift lock is on If not — detected by referencing the system variable at 25145 (contents 0 if shift lock is on, 1 if not) — it ignores character codes less than 64 and alters the state of bit 5 of the obtained character code (ie equivalent to adding or subtracting 32) As an example the character ⌂ printed on the @ key is incorrect and the £ obtained by using the key is in fact right, ie the difference between the £ and @ is 32 The reason the @ key alters its output order is that this routine should have ignored codes less than 65 and not 64 (Rom error) as @ is code 64

Now to alter the Lynx keyboard routines It is possible to change them so that these errors are removed and also so that every standard ASCII code given on pages 81 and 82 of the manual, is available on the keys — instead of having to use *CHR$* to access them

The way this is done is by copying the keyboard scanning routine to the Ram, changing certain addresses and then writing a new routine to deal with the case when shift-lock is off Some of the values in the original routine s tables will also need to be changed The computer will be able to find the modified routine by changing the address in 25092/93 to point to it The new routine is written at the bottom of memory — taking up 450 bytes — and an additional machine-code program has been incorporated that will push the start of the Basic program area above this level To do this it was necessary to change three system variable addresses

25092/93 Start of the BASIC program area.
25094/95 End of the BASIC program
25119/20 End of the array and string variable area.

To carry out the keyboard modification the *Monitor* facility on the Lynx is used to save unnecessary typing If you have not used the *Monitor* before (type in the Basic command *Mon* or *Escape K* to enter) it may be useful to read pages 72 to 77 in the manual But if you follow the outlined procedure below you should not get lost (ie type in the listing after the asterisk prompt and to exit the modification (M) command type <RETURN> ) ■

```
C 09BD 694D 019E                        Copy the keyboard routine to the RAM.

C 0B5B 6A42 0A

M 6985 06 6A                            6A06 - Address of SHIFT LOCK table

M 6990 6F 6A                            6A6F - Address of SHIFT LOCK Shift Table

M 6AB2 4D 69                            Start of the new routine in memory

M 6A46 AB 6A                            Call address modification

M 69AD CD D5 69 18 03                   Alteration in call to SHIFT LOCK-off routine

M 69D5 EB 21 39 62 CB 46 C8 FE 41       New SHIFT LOCK-off routine
       D8 01 69 00 FE 5B 38 0C FE
       61 D8 FE 7B D0 EB AF ED 42
       19 02 EB 09 7E EB C9

M 6A4C 21 42 6A 22 04 62 21 EB 6A       Routine to bring the new keyboard routine
       36 0D 23 36 80 22 FA 61 22       into operation and set up the BASIC program
       FC 61 23 22 1F 62 C9             above this.

M 6A38 5B                               Set up left hand bracket key [ (ASCII 91)

M 6A3D 5D                               Set up right hand bracket key ] (ASCII 93)

M 6A73 7D                               SHIFT ↑ = ↑ (ASCII 125)

M 6A74 7E                               SHIFT ↓ = ↓ (ASCII 126)

M 6A99 60                               SHIFT 0 = £ (ASCII 96)
```

Continued on page 21

```
M 6AA0 5C                        SHIFT @ = \  (ASCII 92)

M 6AA1 5E                        SHIFT [ = ASCII 94

M 6AA6 7F                        SHIFT ] = ASCII 127

M 6AA5 5F                        SHIFT DEL = _ (ASCII 95)

M 6AA7 7C                        SHIFT ← = ←  (ASCII 124)

M 6AAA 7B                        SHIFT → = →  (ASCII 123)

.G 6A4C                          This will set the keyboard routine into
                                 operation.

D 694D 6AE8 6A4C "<program name>" This will save the routine on tape. Using
                                 MLOAD "<program name>" will load the
                                 program into the correct area of memory and
                                 being it was saved with an auto entry
                                 address, it will automatically set up the
                                 new routine.

N.B. The ASCII codes 94 & 127 combined, give the copyright symbol.
```

# Calculated actions

***Trevor Toms** continues his series on machine code with a look at the floating point calculator*

This week we're taking a look at the Spectrum ROM's floating point calculator. It constitutes a reasonable percentage of the ROM coding, and is the heart of the Basic interpreter. Unfortunately, there are far too many facilities to be covered adequately in one article so I can only give details of the most useful features.

First of all, the calculator works like a standard reverse Polish notation calculator in that each arithmetical operator works on the two topmost items on the calculator's stack (as distinct from the Z80 stack) while functions operate on the topmost item. In all cases, the calculator replaces the top two items (or one item in the case of functions) by the resulting value. Besides arithmetical and unary functions, there is an assortment of "utility" functions to manipulate the stack for programming convenience.

Your machine code program can place a number on to the FP (floating point) stack by placing an unsigned 16-bit value in register pair BC then calling a ROM routine (which I call *XSTKBC*) at address 2d2bh. If you want to treat the BC value as a signed value, then you need to code

```
XSTKDATA EQU   2D31h
         LD    BC (item)   ;load data value
         RLC   B           ;obtain data sign in
                            carry
         RRC   B           ;thus retain value
         SBC   A A         ;A=00 if +ve FF if
                            -ve
         LD    E,A         ;place data sign in E
         XOR   A           ;clear accumulator
         CALL  XSTKDATA    ;stack the data
```

Equally, you can take the top item off the stack by using routine *XGETBC* at address 2DA2h. The number thus obtained is left in registers BC and has been rounded to the nearest integer. If the value is outside the usual 16-bit range (-32768<=x<=65535) then the carry flag will be set.

So we've got items onto and off the stack now we need to manipulate them. In all cases, use of the FP calculator is initiated by the *RST 28h* instruction. Following this, you need to code a series of data bytes which define the various operations that you want the calculator to perform. Your final operation is always *'DEFB 38h'* which returns control back to your own program.

Before I give you a list of some of the operations, let's see an example of dividing two numbers, giving a result in registers BC.

```
XSTKBC    EQU  2D2Bh
XGETBC    EQU  2DA2h
PRINT$NUM EQU  1A1Bh
  LD      BC,253      ;stack the first value
                       (253)
  CALL    XSTKBC
LD        BC 17       ;stack the second value
                       (17)
CALL      XSTKBC
RST       28h         ;start the calculator
DEFB      05h         "divide" (giving
                       253/17)
DEFB      38h         ;exit calculator
CALL      XGETBC      ;obtain result
CALL      PRINT$NUM   ;print it
RET
```

The list in Table 1 gives the operation code value of some of the more useful calculator operations. I trust that a lot of these are familiar and hopefully self-explanatory, but I will elaborate on some of the miscellaneous operations.

The first of these are "stack maintenance" operations — *DEFB 01h* swaps the two topmost items on the stack, *DEFB 02h* deletes the top item leaving the next item on top. *DEFB 31h* duplicates the top item, normally used to allow your program to test for ranges without losing the original value. Operations *36h* and *37h* replace the top item with the value 0 or 1 depending on the truth of the test made.

Of particular interest are the "memory" operations. These allow you to save stacked items or retrieve them from one of five calculator-style memories. By coding as shown below, you can save a copy of the topmost item on the stack.

```
DEFB   0C0h      ;save top item in memory 0
DEFB   0C1h      ;save top item in memory 1

DEFB   0C4h      ;save top item in memory 4
```

Similarly, you can retrieve one of these memories and place it back on the stack by coding

```
DEFB   0E0h      ;retrieve from memory 0
DEFB   0E1h      ;retrieve from memory 1

DEFB   0E4h      ;retrieve from memory 4
```

Two remaining operations need explanation. These are "jump"-type operations, and allow you to alter the flow of logic within the calculator. The first of these is *DEFB 33h* which forces an unconditional relative jump to the operation "n" bytes away, where "n" is a single byte following the operation byte. For example

```
       RST 28h    ;initiate calculator
       ..         ;your own operations here
       DEFB 33h   ;jump
       DEFB 03h   three bytes forward to HERE
       DEFB XX
       DEFB XX
HERE   DEFB 38h   exit calculator
```

You will notice that this technique differs slightly from the Z80 relative-jump convention in that the relative value is one more than a corresponding JR instruction offset. Negative offsets can be used as well.

The final operation is a conditional jump, *DEFB 00h*, which jumps in a similar fashion but only if the topmost stacked item is non-zero. This operation also deletes teh topmost item.

A final ROM routine for you this week is

**TABLE 1**

**Arithmetic Operations**

These operate on the top two items of the stack to leave one final result

DEFB 03h Subtract
DEFB 04h Multiply
DEFB 05h Divide
DEFB 06h Exponentiate
DEFB 0Fh Add
DEFB 32h Modulus

**Functions**

These operate on the topmost item of the stack replacing it by the new value

DEFB 1Bh Negate
DEFB 1Fh SIN
DEFB 20h COS
DEFB 21h TAN
DEFB 22h ASN
DEFB 23h ACS
DEFB 24h ATN
DEFB 25h LN
DEFB 26h EXP
DEFB 27h INT
DEFB 28h SQR
DEFB 29h SGN
DEFB 2Ah ABS

**Logical Operations**

These operate on the top two items, leaving a value of 1 for a true result, or zero for a false result

DEFB 07h OR
DEFB 08h AND
DEFB 09h <-
DEFB 0Ah >
DEFB 0Bh <>
DEFB 0Ch >
DEFB 0Dh <
DEFB 0Eh ~

**Miscellaneous**

These are sundry items to give more flexibility

DEFB 01h Exchange top 2 items
DEFB 02h Delete top item
DEFB 31h Duplicate top item
DEFB 36h Top item less than 0
DEFB 37h Top item grtr than 0
DEFB 0Cxh Store in memory x
DEFB 0Exh Get memory x
DEFB 38h Exit calculator
DEFB 0A0h Place zero on stack
DEFB 0A1h Place 1 on stack
DEFB 0A2h Place 0.5 on stack
DEFB 0A3h Place PI/2 on stack
DEFB 0A4h Place 10 on stack

one that prints the topmost stacked item onto the current stream, deleting it afterwards. The printed value obeys the usual rules of using "E"-format if the number is beyond the standard range. This routine, called *XPRTFP*, is invoked by calling address 2DE3h.

Listing 1 gives you a complete example to look at. It is a small program that counts from 0 to 10 in 0.25 steps, printing each value in turn. I have written the program in a manner that makes use of most of the features shown above — once you've worked your way through it I'm sure you'll be able to make good use of the calculator in your own programs.

Incidentally, in producing Listing 1, I came up against a rather tiresome bug in the ROM, whereby the *XPRTFP* routine leaves an erroneous value on the calculator stack if the number being printed is in the rage −1<=x<=1, but not zero.

Listing 2 is a small subroutine called *PRINT$FP* which you can include in your own programs. It prints the topmost item on the stack, leaving it unaffected in any way, and allowing for the fact that the number may have any value.

Next week we return to the hardware to look at ways of using the beeper. ■

By Trevor Toms, author of The Spectrum Pocket Book, published by Phipps Associates

**Listing 1**

**Listing 2**

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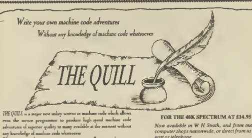
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# Thanks for the memory

***Brian Cadge** looks at the DOS cartridge and what it can do for your programming*

Plugging the DOS cartridge into your Dragon does more than just attach the disk drives. On power up it rearranges the Dragon's memory map. To accomodate the ¾k of disk buffer space and the additional memory mapping for the DOS Basic commands, graphics page one (ie memory addresses 1536 to 3071) is used. Basic is adjusted so that graphics page 2 becomes page 1 and so on, so to the Basic programmer the only visable change is the loss of 1.5k of free memory.

For the machine code programmer there are many useful subroutines contained in the disk ROM that could be accessed. Many locations in the disk memory map are also useful and we will come to these later. Firstly I'm sad to say that there are the inevitable ROM bugs in the disk Basic. These are the ones I have come across although there may be more.

When using the Save command to save a block of machine code, the format is *Save "PROG", Start, End, Entry*. The Basic starts dumping memory to disk from the location *Start* for the length *End-Start*, as you may realise, the length should be *(End-Start) + 1* but as it is not adjusted the result is that the last byte is not saved on disk. The obvious remedy is to add one to *End* when using the command — this is a fundamental programming error and how it was overlooked I cannot imagine.

Another, more serious, bug is in the *Chain* command. If the program is too long to fit in the available space, it is likely to overwrite the DOS buffer causing a system crash. The remedy to this one is to avoid chaining programs over 10k and to use *Clear* and *FRE$* before hand. Of course the whole point of *Chain* is that it does not affect variables as a *Clear* command would, so this is not a very satisfactory answer.

The *Run* command when used in conjunction with a disk program cannot be used with string variables. That is, you can have *Run "Program. Bas"* but not *A$="Program Bas" A$*. This isn't a bug as the *Run* command is linked to the disk Rom via a subroutine from location 404 and the standard *Run* command clears all variables so you cannot use a variable of any sort after the word Run. this explanation should have been included in the manual.

In case you are having trouble with the *Boot* command, there is no bug here, but it cannot be used on a standard directory program and will give a *?BT Error* if it cannot find the 'OS' identifier. The command is only really suitable for loading new operating systems on a 64k machine.

Moving onto the internal organisation of the disk operating system, the directory is on track 20 and this track is therefore always verified after a write. The other tracks may be verified by use of the *Verify On/Off* command. Each program uses 25 bytes in the directory, the first starting on sector 3. The first byte is an attribute byte for the file — bit 2 if set identifies a protected file and if bits 0 and 7 are set this means that the file has since been killed off.

The next eight bytes are the filename and then come three bytes for the file specifier, either Bas,Bak,Bin,Dat,etc. The 15th byte is equal to the high byte plus one of the length of the file and the 25th byte contains the low byte of the length.

It is not advisable to change the directory manually using *Swrite* as you may corrupt it and have to reformat the disk. If you do accidentally *Kill* a valuable file, it can be restored by zeroing the first byte of its 25 byte section. You will need to use *Spread* to find the position on the disk and *Swrite* to change the directory. The moral is to use *Protect* on valuable files.

Incidentally, if you save a file with no file name ie, *Save""* it cannot be changed or touched at all except to load it.

On to the disk memory map. The main change to the normal Dragon memory map is that the *USR* entry address vector table has been moved to begin at 1667 and many of the link subroutines are now used; these start at 359. The interrupt has been extended to control the time delay before switching off the disk motor.

Often in a program it can be annoying to have the disk motor stop-starting, so if you want the drives to continue rotating until the program stops, simply type *Poke 246, 255* on a program line. The new IRQ starts at 50944, and consequently the sound quality on high pitched notes deteriorates even further.

Below are all the useful memory locations in the new DOS memory map and their uses.

| | |
|---|---|
| 1541 = | Interrupt countdown to motor stop — when it gets to zero the disk drive is stopped |
| 1544 = | Verify on/off flag |
| 1548 – | Current disk drive number |
| 1549/50 – | Start line number for AUTO command |
| 1551/52 = | Increment value for AUTO command |
| 1555 – | AUTO on/off flag |
| 1556 = | ERROR GOTO flag |
| 1557 56 = | ERROR GOTO line number |
| 1559/60 = | Line number of last error |
| 1561 = | Error code of last error |
| 1618/19 = | Start address for a machine code load |
| 1620/21 = | Length of a machine code load |
| 1622/23 = | Entry address of a machine code load |
| 1667 1686 = | USR0 to USR9 entry address vectors |
| 1725/1732 – | Filename of disk program |
| $FF40 – | Disk controller I/O page |
| $FF48 – | Disk controller motor on/off (0=all drives stopped) |

There are a number of useful *ROM* routines that can be used: the routine starting at 53581 will return the amount of free disk space in the floating point accumulator, the zero flag is set for an IO error. 36055 performs the garbage collection that the *FRE$* function includes, this can be used by users without disk drives who therefore don't have the *FRE$* function.

The subroutine starting at 56267 can be used for delays, the X register is loaded with the length of the delay in milliseconds. The program listed will display all of the new DOS commands and their machine code entry point. Some routines can be used directly, while others, eg, *Load*, need some parameters to be set up first. ■

```
10 Z=57044:X=56915
20 FORI=1 TO 26:A$=""
30 A=PEEK(Z):IF A<128 THEN A$=A$+CHR$(A):Z=Z+1:
   GOTO30 ELSE A$=A$+CHR$(A-128)
40 Z=Z+1:A=PEEK(X)*256+PEEK(X+1):X=X+2
50 PRINT#P,A$;STRING$(16-LEN(A$),".");A
60 NEXTI
```

# Gang of three

*Lee Tanner demonstrates how you can draw pictures on the screen using three colours*

This program allows you to draw pictures on the screen using three colours. You will need a joystick and Simon's basic to run it. When running the program, you will see the title page; press any key and you will be asked to enter the three colours you want to use. The screen will then clear ready for your drawing.

Use the fire button to draw a line and release it to move without drawing. You can draw in eight directions. On the left of the screen you will see three coloured blocks and the words *Fill*, *Rub*, *Cls* and *End*. The three blocks are coloured according to the three colours you entered at the begining of program.

To change the drawing colour, move the drawing point to one of the blocks and press the fire button.

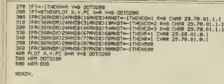
The four commands on the left are as follows:

FILL Enables you to fill an enclosed area
RUB Enables you to rub out any unwanted lines
CLS Clears the screen
END Ends the program

As the program is written in Basic it is relatively slow but it's fun to use and can achieve some pleasing results. Here is a rundown of how the program works:

| | |
|---|---|
| 9 — 62 | Title page |
| 69 — 99 | Enter the three colours you learn |
| 100 — 170 | Set up drawing screen |
| 200 — 280 | Main loop for drawing and filling |
| 500 — 320 | Change the drawing colour |
| 300 | Sets FILL mode |
| 340 | Sets RUBOUT mode |
| 350 | If CLS then jump to 500 |
| 360 | If END then jump to 600 |
| 600 | Loop back to main drawing loop |
| 500 | Clear screen |
| 600 | End program |

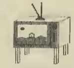
```
9 PRINT"J"
16 NIRES 8,8 MULTI 2,6,1 COLOUR 14,16
28 TEXT 52,15,"MPRINTER",2,3,8
21 TEXT 53,16,"MPRINTER",3,3,8
22 TEXT 54,17,"MPRINTER",1,3,8
23 REC 48,18,63,34,1
24 REC 46,8,69,38,3
25 REC 44,6,73,42,2
25 LOW COL 6,0,1
30 LINE 150,70,80,98,1 LINE 156,74,81,100,1
31 LINE 150,70,150,74,1 LINE 75,50,81,106,1 PAINT 65,95,1
32 LINE 70,51,70,54,3 LINE 86,100,71,102,3 LINE 69,54,71,102,3 PAINT 72,96,3
33 LINE 69,95,57,102,2 LINE 69,102,57,104,2 LINE 66,98,55,101,2
34 LINE 68,100,58,103,2
35 PLOT 56,103,3 PLOT 58,104,3 PLOT 57,102,3 PLOT 57,103,3 PLOT 57,104,3
36 PLOT 58,102,3 PLOT 56,103,3 PLOT 56,104,3
37 PLOT 59,102,3 PLOT 55,103,3 PLOT 59,104,3 PLOT 59,161,3
39 HI COL
40 TEXT 26,112,"MBY LEE TANNER",1,2,8
41 TEXT 27,113,"MBY LEE TANNER",2,2,8
42 TEXT 28,114,"MBY LEE TANNER",3,2,8
50 TEXT 42,130,"M17/10/83",1,2,8
51 TEXT 43,131,"M17/10/83",2,2,8
52 TEXT 44,132,"M17/10/83",3,2,8
60 LOW COL 5,3,14 TEXT 14,160,"MANY KEY TO START",1,2,8
61 TEXT 15,161,"MANY KEY TO START",2,2,8
62 TEXT 16,162,"MANY KEY TO START",3,2,8
69 POKE198,0
70 GETG$ IFG$=""THEN70
80 NRM
85 INPUT"ENTER COLOUR 1 (6-15)",C1
86 IFC1<6ORC1>15THEN85
56 INPUT"ENTER COLOUR 2 (6-15)",C2
51 IFC2<6ORC2>15THEN90
95 INPUT"ENTER COLOUR 3 (6-15)",C3
96 IFC3<6ORC3>15THEN95
59 PRINT"J"
100 HIRES 0,0 MULTI C1,C2,C3 COLOUR 12,1
110 BLOCK 25,5,35,15,1 BLOCK 25,26,35,30,2 BLOCK 25,35,35,45,3
120 LOW COL 11,5,6 TEXT 1,60,"MFILL0",1,1,7
130 TEXT 1,70,"MRUB 0",1,1,7
140 LINE 40,0,40,199,1
150 TEXT 1,80,"MCLS 0",1,1,7
160 TEXT 1,90,"MEND 0",1,1,7 HI COL
170 X=100 Y=100 CO=1
200 PC=TEST(X,Y) PLOT X,Y,CO A=X B=Y Z=(JOYOR128) T=(JOY>S)
210 A=A+(Z=134)+(Z=135)+(Z=136)-(Z=130)-(Z=131)-(Z=132)
220 B=B+(Z=136)+(Z=129)+(Z=130)-(Z=132)-(Z=133)-(Z=134)
230 IFA>319ORB<6ORB>159THEN200
240 IFA<42THEN300
250 IFF=1ANDT=-1THENPLOT X,Y,6 PRINT A,B,CO:X=A Y=B F=0 CHAR 23,68,81,1,1
    GOTO266
260 IFR=1ANDT=-1THENPLOT X,Y,0 X=A Y=B GOTO200
```



```
270 IFT=-1THENX=A Y=B GOTO200
280 IFT=0THENPLOT X,Y,PC X=A Y=$ GOTO200
300 IFA<36ANDA>24ANDB<16ANDB>4ANDT=-1THENCO=1 R=0 CHAR 29,70,81,1,1
310 IFA<36ANDA>24ANDB<31ANDB>13ANDT=-1THENCO=2 R=0 CHAR 29,70,81,1,1
320 IFA<36ANDA>24ANDB<46ANDB>34ANDT=-1THENCO=3 R=0 CHAR 29,70,81,1,1
330 IFA<36ANDA>29ANDB<67ANDB>60ANDT=-1THENF=1 CHAR 29,60,81,0,1
340 IFA<36ANDA>29ANDB<77ANDB>70ANDT=-1THENR=1 CHAR 29,70,81,0,1
350 IFA<36ANDA>29ANDB<67ANDB>60ANDT=-1THEN500
360 IFA<36ANDA>29ANDB<97ANDB>90ANDT=-1THEN600
400 PLOT X,Y,PC X=A Y=$ GOTO200
500 NRM GOTO100
600 NRM END

READY.
```





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# Face the music

***D Francis** describes a routine that makes it simple to make music with your BBC*

This is a program for the BBC A or B In fact it is a *Procedure*, named *Procplay* which plays a tune which may be defined as a string eg *CDEFGAB"* To use it, place the required string into the routine using something like this *Procplay "V1503S24CE GEG04C03G04CECEG*

The following can be used in the parameter string

**NOTES** C D E F G A B and their sharps and flats, indicated by a sharp sign and a minus sign respectively Their lengths are assumed to be 4 (crotchets) unless you specify their type

| | |
|---|---|
| Semibreve | 1 |
| Minim | 2 |
| Crotchet | 4 |
| (assumed if no number specified) | |
| Quaver | 8 |

**TEMPO** The speed of the whole tune may be altered by setting the length of a semibreve (in twentieths of a second) So, to select a speed of 5 second per semibreve the instruction would be S10 (10 times 1/20 is 0 5)

**VOLUME** This is set by typing V followed by a number from 0 to 15, eg V15 sets the volume to maximum

**OCTAVE** This enables you to choose between the BBC's five octaves The full octaves are numbered 1 to 5 eg, 04 set octave to number 4 N B The octaves are each CDEFGAB so BCBCBCBC would produce a series of notes 11 semitones apart, not 1 as may be expected

**NORMAL** The instruction "N" resets the values of Semibreve Volume, Octave to those given in line 10

As the routine itself is a *Procedure* it may be called by *Basic*, although you must remember to use a line like line 10 *before* the first call to *Procplay* The program could be speeded up (slightly) by using integer variables, enabling faster tunes or it can be compressed by omitting space and shortening the variable & *Proc*names ■

```
10 CHANNEL=1   SEMIBREVE=32 : VOLUME= -10: OCTAVE=3

30000 DEFPROCplay (A$)
30010 LOCAL X,Y,Z,LEGAL
30020 IF A$="" THEN ENDPROC
30030 FOR X = 1 TO LEN(A$)
30040   LEGAL= FALSE
30050   Y$=MID$(AS,X,1)
30060   Y=ASC(Y$)
30070   IF Y$>="A" AND Y$<="G" THEN PROCDoNote : LEGAL=TRUE
30080   IF Y$ ="S" THEN PROCgetno : SEMIBREVE=Z   LEGAL=TRUE
30090   IF Y$ ="V" THEN PROCgetno . VOLUME = - ABS(Z) : LEGAL=TRUE
30100   IF Y$ ="O" THEN PROCgetno : OCTAVE = Z : LEGAL=TRUE
30110   IF Y$ ="N" THEN VOLUME= -10 : OCTAVE=3 . SEMIBREVE = 32: LEGAL=TRUE
30120   IF NOT LEGAL THEN PRINT"Error in PROCplay, Somewhere near Char. ",X: STOP
30130   NEXT X
30140 ENDPROC
30150 DEFPROCgetno
30160 LOCAL A,  B$ Z=O
30170 X=X + 1
30180 REPEAT B$=MID$(A$,X,1):LEGALno=FALSE
30190   IF B$>="0" AND B$<="9" THEN Z=10* Z + VAL(B$):LEGALno = TRUE:X=X+1
30200   A=A + 1
30210   UNTIL X >=   LEN(A$) OF LEGALno = FALSE:X=X-1
30230 ENDPROC
30240 DEFPROCDoNote
30250 LOCAL B,P,Z
30260 SF$ = MID$(A$,X+1,1)  B=0 : IF SF$ = "#" THEN B=4: X=X+1 ELSE IF SF$ = "-"
      THEN B= -4.X=X + 1
30270 PROCgetno . IF Z=0 THEN Z=4
30280 P = B + OCTAVE*48  - 47 + VAL(MID$( "05132125334149",INSTR("CDEFGAB",Y$)*2-1,2))
30290 SOUND CHANNEL,VOLUME,P,SEMIBREVE/Z
30300 ENDPROC
```

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## Stunt

### on Spectrum

You control a motorbike that must jump over some buses to land on a ramp at the other side. Each time you manage it another bus is added to the total (up to eleven). The only key used is the *Space* key to make you gain speed.

As the only thing that moves is the bike *Plot* and *Draw* are fast enough, so the bike is in high revs.

**Program notes**

| | |
|---|---|
| 30 | Graphics A+B |
| 33 | Graphics I |
| 80 | Graphics C D E F G H H G F E D C |
| 100-300 | Main loop plots man and calculates his position |
| 1000-1070 | Bike lands on ramp |
| 9010-9510 | Bike crashes |
| 9600-9670 | Instructions |

**Variables**

| | |
|---|---|
| li | Number of lives |
| Z(100)y | Position of bike on the ramp |
| i | X co-ordinate |
| y | Y co-ordinate |
| be | Bus variable |
| made it | Bike lands safely |
| crash | Bike crash |
| b | Velocity of bike going up |
| v | Velocity of bike going across |
| c | 1 if it is past the first ramp |
| g and h | co-ordinates for crash |

```
1005 PLOT x,y  DRAW 1,0  DRAW 0,
1  DRAW -1,0  PLOT x+1,y+2  DRAW
 3,0  DRAW 0,-2  DRAW 1,0  DRAW
0,1  PLOT x+5,y+4  PLOT x+4,y+3
 DRAW -2,0  DRAW 0,2  DRAW 1,0
DRAW 0,-1
1006 LET m=x  LET n=y
1010 IF x<d AND POINT (x,y-1)=0
THEN LET y=y-1
1020 LET v=v+.5  LET x=x+v
1021 IF x>d THEN LET y=56
1030 IF v>0 THEN LET v=8
1031 OVER 1  PLOT m,n  DRAW 1,0
 DRAW 0,1  DRAW -1,0  PLOT m+1,n
+2  DRAW 3,0  DRAW 0,-2  DRAW 1,
0  DRAW 0,1  PLOT m+5,n+4  PLOT
m+4,n+3  DRAW -2,0  DRAW 0,2  DR
AW 1,0  DRAW 0,-1
1032 OVER 0
1040 NEXT x
1050 LET j=j+1
1051 IF j=12 THEN LET j=11
1052 IF j=5 THEN LET li=li+1: PR
INT AT 0,20,"Lives=",li
1060 PRINT AT 0,0,"Buses=",j
1061 LET x=1  LET y=56
1062 PLOT x,y  DRAW 1,0  DRAW 0,
1  DRAW -1,0  PLOT x+1,y+2  DRAW
 3,0  DRAW 0,-2  DRAW 1,0  DRAW
0,1  PLOT x+5,y+4  PLOT x+4,y+3
 DRAW -2,0  DRAW 0,2  DRAW 1,0
DRAW 0,-1
1070 GO TO 80
9010 LET g=x+3-3*(x>245)  LET h=
y+2
9020 FOR n=1 TO 30
9030 OVER 0  INK 5  PLOT g,h  BE
EP .004,RND*10-10  DRAW (INT (RN
D*12)-6),INT (RND*12)-6  NEXT n
9031 FOR n=1 TO 150  NEXT n
9032 INK 7
9035 LET li=li-1  IF li=0 THEN P
RINT AT 0,20,"Lives=0"  GO TO 95
00
9040 CLS  PRINT AT 2,12,"STUNT"
 LET s=0  PRINT AT 0,0,"Buses="
,j,AT 0,20,"Lives=",li
9050 GO TO 10
9500 PRINT #1, FLASH 1,"ENTER to
 play again
9510 IF CODE INKEY$=13 THEN CLS
 GO TO 2
9520 GO TO 9510
9600 BORDER 0  PAPER 0  BRIGHT 1
 INK 7  CLS
9610 PRINT AT 0,12 "Stunt",AT 1,
15,
9620 PRINT '" You are in control
 of a power-''ful Stunt Bike."
9630 PRINT " You use the SPACE
key to gain''"speed.The longer
you keep your"''"finger down,th
e futher you  ''"travel through
the air
9640 PRINT " To make a landing
 and to gain" "another bus you
must land on the '  ramp on the
other side."
9650 PRINT #1  FLASH 1,'
Any key to play
9660 IF INKEY$=  THEN GO TO 966
0
9670 RETURN
   1 GO SUB 9600
   2 LET li=4  LET m=1  FOR n=0
TO 7  POKE USR "a"+n,m  LET m=m+
2  NEXT n
   3 LET m=128  FOR n=0 TO 7  PO
KE USR "b"+n,m  LET m=m/2  NEXT
n
   4 BORDER 0  PAPER 0  BRIGHT 1
 INK 7  CLS
   5 PRINT AT 2,12,"STUNT"  PRIN
T AT 0,0,"Buses=2",AT 0,20,"Live
s=4
   6 DIM z(100)  LET m=0  FOR n=
50 TO 98  LET z(n)=INT (m/5)+1
LET m=m+1  NEXT n
   7 LET j=2
  10 LET x=1  LET y=56
  20 PLOT x,y  DRAW 1,0  DRAW 0,
1  DRAW -1,0  PLOT x+1,y+2  DRAW
 3,0  DRAW 0,-2  DRAW 1,0  DRAW
0,1  PLOT x+5,y+4  PLOT x+4,y+3
 DRAW -2,0  DRAW 0,2  DRAW 1,0
DRAW 0,-1
  30 PRINT AT 15,0, PAPER 4, INK
0,"^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^
  31 RESTORE 32  FOR n=0 TO 7  R
EAD m  POKE USR "i"+n,m  NEXT n
  32 DATA BIN 0,BIN 111110,127,B
IN 1101011,BIN 1101011,127,127,B
IN 1100011
  33 LET [illegible]
  [illegible]
  41 LET crash=9000
  45 DATA "c","d","e","f","g","h
"
  50 FOR n=1 TO 6
  60 READ a$  FOR m=0 TO 7  POKE
 USR a$+m,0  NEXT m
  70 FOR m=7 TO 7-n+1 STEP -1  P
OKE USR a$+m,255  NEXT m  NEXT n
  80 PRINT AT 14,7,"[illegible]", IN
K 2,b$(1 TO j), INK 7,"[illegible]"
  90 LET d1=104+((2+j)*8)  LET d
=104+((j+8)*8)  LET c=0  LET v=0
 LET b=0
 100 IF x<98 AND v<9 AND INKEY$=
" " THEN LET v=v+1
 110 IF v=0 THEN LET v=0  BEEP
.003,0  GO TO 100
 120 IF v>0 THEN LET v=v-.25
 130 IF x>98 AND c=0 THEN LET b=
v+1  LET c=1
 150 IF x>d AND y=56 OR x<=245 AN
D y>56 THEN GO TO crash
 200 OVER 1  PLOT x,y  DRAW 1,0
 DRAW 0,1  DRAW -1,0  PLOT x+1,y
+2  DRAW 3,0  DRAW 0,-2  DRAW 1,
0  DRAW 0,1  PLOT x+5,y+4  PLOT
```

```
x+4,y+3  DRAW -2,0  DRAW 0,2  DR
AW 1,0  DRAW 0,-1
 260 LET y=y+2*(b>1)-1.5*(b<0)
IF c=1 THEN LET b=b-1  LET x=x+1
 262 IF x>=104 AND x<=104+((j+2)
*8) AND y<63 THEN GO TO crash
 265 IF y<56 THEN LET y=56
 280 OVER 0  LET x=x+v
 281 IF x<-38 THEN LET y=56+z*IN
T (<+.5))
 282 IF x>112 AND x<d1 AND y<=63
 THEN GO TO crash
 283 IF x>104 AND <<d AND POINT
(x,y-1)=1 THEN GO TO made it
 290 PLOT x,y  DRAW 1,0  DRAW 0,
1  DRAW -1,0  PLOT x+1,y+2  DRAW
 3,0  DRAW 0,-2  DRAW 1,0  DRAW
0,1  PLOT x+5,y+4  PLOT x+4,y+3
 DRAW -2,0  DRAW 0 2  DRAW 1,0
DRAW 0,-1
 300 GO TO 100
1000 FOR x=x TO 249
```

**Stunt**
*by Mark Smith*

## Pontoon
### on BBC

This is a sophisticated version of the famous card game which should work on both the BBC B and the Electron

**Program notes**

| | |
|---|---|
| 80-250 | Redefine characters |
| 290-400 | Construct and shuffle deck |
| 480-650 | Set screen |
| 700-840 | Player's go |
| 850-1080 | Deal next card |
| 1090-1250 | Computer's go |
| 1290-1350 | Rebuild deck from shuffled deck |
| 1440-1540 | Display rules |
| 1550-1620 | Outline spaces for cards |

```
10REM **********
20REM *PONTOON *
30REM *(c)1983 *
40REM *M FERRIS*
50REM **********
60MODE6
70VDU23 1 0,0 0,0;
80VDU23 224,34,119 127,127,62,28,8,0
90VDU23,225 28 28,107 127 107,8,28,0
100VDU23 226,8,28,62,127 62,28,8 0
110VDU23 227 8,28,62,127,62,8,28,0
120VDU23 228 207,73,73,73,73,73,79,0
130VDU23 229 1,1,1,1,1,1,1,1
140VDU23 230 129,66,36,24,24,36,66,129
150VDU23 231,128 128,128 128,128,128,128,128
160VDU23 232 255 0,0,0,0,0 0,0
170VDU23,233 0,0,0 0,15,15,15,15
180VDU23,234 15,15,15 15 15,15,15,15
190VDU23,235,240 240,240,240,15 15 15,15
200VDU23 236,240,240 240,240 240,240,240,240
210VDU23 237 240 240,240,240,0,0,0,0
220VDU23,238 0,0,0 0,255,255,255,255
230VDU23,239 255,255,255,255,0,0,0,0
240VDU23 240,255 255,255,255,240,240,240 240
250VDU23 241 15,15,15,15,0,0,0,0
260PW=0 CW=0
270DIM A$(51)
280PROCrules
290FOR A%=1 TO 13 FOR B%=224 TO 227
300 IF A%=1 THEN B$=B$+"A"+CHR$B% GOTO 360
310 IF A%=10 THEN B$=B$+CHR$228+CHR$B% GOTO 360
320 IF A%=11 THEN B$=B$+"J"+CHR$B% GOTO 360
330 IF A%=12 THEN B$=B$+"Q"+CHR$B% GOTO 360
340 IF A%=13 THEN B$=B$+"K"+CHR$B% GOTO 360
350 B$=B$+STR$(A%)+CHR$B%
360NEXT NEXT
370FORA%=51 TO 0 STEP-1
380 B%=2*INT(RND(A%))+1
390 A$(A%)=MID$(B$,B%,2)
400 B$=LEFT$(B$,B%-1)+RIGHT$(B$,LEN(B$)-B%-1)
410NEXT
420PRINT TAB(7 30)"PRESS SPACE BAR TO CONTINUE"
430IF INKEY(-99) THEN GOTO460
440IF INKEY(-74) THEN STOP
450GOTO430
460X=0 Y=0 PSC=0 CSC=0 PNC=2 CNC=2
470CARD=3
480SOUND 1 -15,100,5 SOUND 1 -15,32,5
490 MODE 1 VDU19,0,2 0 0 0 19,2,4,0,0,0
    VDU23,1,0 0,0 0  PRINT
500PRINT TAB(16 1)"PONTOON" COLOUR1 PRINT TAB(16,2)
   CHR$(226) COLOUR2 PRINT TAB(18,2) CHR$(225
   COLOUR1 PRINT TAB(20 2) CHR$(224) COLOUR2
   PRINT TAB(22,2) CHR$(227)
510COLOUR3 PRINT TAB(0 1) "'D' To Deal"''"'S  To
   Stick" PROCspaces
520C$=A$(0)
530PROCclea
540X=2 Y=6 PROCdeal
550PSC=PSC+CV
560X=10 C$=A$(2)
570PROCdeal P$=A$(0)+A$(2)
580PSC=PSC+CV
590PRINT TAB(6 15)"Your Score is ",PSC
600IF LEFT$(A$(0),1)="A" OR LEFT$(A$(2),1)="A"
   THEN PRINT" or ",PSC+10610 X=10 Y=19 C$=A$(1)
610COLOUR131 COLOUR1 PRINT TAB(2,19)" ___ "
630FORC%=20 TO 24 PRINT TAB(2,C%)CHR$229,CHR$236,
   CHR$238,CHR$238,CHR$231 NEXT
640PRINT TAB(2,25)" " CHR$231,CHR$232,CHR$232," "
650SOUND1,-15,60,1 SOUND1 -15,90 1
660PROCdeal
670CSC=CSC+CV E$=A$(1)+A$(3)
680X=10 Y=6
690IF(LEFT$(A$(2),1)="A"AND(LEFT$(A$(0),1)="Q"
   ORLEFT$(A$(0),1)="K"ORLEFT$(A$(0),1)="J"))OR
   (LEFT$(A$(0) 1)="A")AND(LEFT$(A$(2),1)="J"
   ORLEFT$(A$(2) 1)="Q"ORLEFT$(A$(2),1)="K")THEN
   PRINTTAB(4,15)"PONTOON Scores 21
   " PSC=21 PROCgood GOTO1090
700*FX21 0
710R$=GET$
720IF R$="S" OR R$="s" THEN GOTO1340
730IF R$="D" OR R$="d" THEN GOTO750
740GOTO710
750CARD=CARD+1
760PNC=PNC+1 C$=A$(CARD) PROCdeal X=X+8
   PSC=PSC+CV P$=P$+C$
770PRINT TAB(6 15)"Your Score is ",PSC.
780FOR C%=1TOLENP$ IFMID$(P$ C%,1)="A' AND
   PSC(12THENPRINT" or ",PSC+10 GOTO800
790NEXT PRINT"          "
800C%=CARD
810IF PSC>21 THEN PRINT TAB(6 15)"BUST " SOUND1,
   -15,4,7 CW=CW+1 PROCscores PROCshuffle GOTO370
820IF PNC=5 THEN PRINT TAB(6,15)'Five-Card-Trick '
   " PROCgood GOTO1090
830IF PSC=21 THEN PRINT TAB(6 15)
   "You Have Scored 21" PROCgood GOTO1090
840GOTO700
850DEF PROCdeal
```

```
860 IF LEFT$(C$,1)="A" THEN CV=1 GOTO 890
870 IF LEFT$(C$,1)=CHR$234 OR LEFT$(C$,1)="J" OR
    LEFT$(C$,1)="Q" OR LEFT$(C$,1)="K" THEN CV=10
    GOTO 890
880CV=VAL(LEFT$(C$,1))
890 IF RIGHT$(C$,1)=CHR$(226) OR RIGHT$(C$,1)=CHR$
    (226) THEN COLOUR 1 GOTO910
900COLOUR 2
910D$=RIGHT$(C$,1)
920 COLOUR 131 FORY%=Y TO Y+6 PRINT TAB(X,Y%)"
    " NEXT
930PRINT TAB(X,Y)C$
940 IF CV=1 THEN PRINT TAB(X+2,Y+2)D$ GOTO1070
950IF CV=2 THEN PRINT TAB(X+2,Y+1)D$,
    TAB(X+2,Y+4)D$ GOTO1070
960IF CV=3 THEN PRINT TAB(X+2,Y+1)D$,TAB(X+2,
    Y+3)D$,TAB(X+2,Y+5)D$ GOTO1070
970IF CV=4 THEN PRINT TAB(X+1,Y+1)D$," ",
    D$,TAB(X+1,Y+5)D$," ",D$ GOTO 1070
980IF CV=5 THEN PRINT TAB(X+1,Y+1)D$," ",D$ TAB
    (X+2,Y+3)D$,TAB(X+1,Y+5)D$," ",D$ GOTO 1070
990 IF CV=6 THEN FOR C%=1 TO5 STEP2 PRINT TAB(X+1,
    Y+C%)D$," ",D$ NEXT GOTO 1070
1000 IF CV=7 THEN FOR C%=1 TO5 STEP2 PRINT TAB(X+1,
    Y+C%)D$," ",D$ NEXT PRINT TAB(X+2,Y+2)D$ GOT
    O 1070
1010IF CV=8 THEN FOR C%=2 TO 5 PRINT TAB(X+1,
    Y+C%)D$," ",D$ NEXT GOTO 1070
1020 IF CV=9 THEN FOR C%=1 TO 5 PRINT TAB(X+1,
    Y+C%)D$," ",D$ NEXT PRINT TAB(X+2,Y+3)D$
    GOTO 1070
1030 IF LEFT$(C$,1)=CHR$228 THEN FOR C%=1 TO 5
    PRINT TAB(X+1,Y+C%)D$," ",D$ NEXT GOTO 1070
1040IF LEFT$(C$,1)="J" THEN PRINT TAB(X+2,Y+1)
    CHR$233,CHR$238,TAB(X+3,Y+2)CHR$236
    TAB(X+3,Y+3)CHR$236 TAB(X+1,Y+4)CHR$233," "
    CHR$236,TAB(X+2,Y+5)CHR$239 GOTO1070
1050IF LEFT$(C$,1)="Q" THEN PRINT TAB(X+1,Y+1)
    CHR$238,CHR$128 CHR$238,TAB(X+1,Y+2)
    CHR$226," ",CHR$234,TAB(X+1,Y+3)CHR$234," ",
    CHR$234,TAB(X+1,Y+4)CHR$226;CHR$223,CHR$224,
    TAB(X+1,Y+5)CHR$239,CHR$239,CHR$240
    GOTO 1070
1060IF LEFT$(C$,1)="K" THEN PRINT TAB(X+1,Y+1)
    CHR$233," ",CHR$233,TAB(X+1,Y+2)CHR$234,
    CHR$235,CHR$237,TAB(X+1,Y+3)CHR$234
    CHR$235 TAB(X+1,Y+4)CHR$234," ",CHR$235
    TAB(X+1,Y+5)CHR$241," ",CHR$241
1070COLOUR3 COLOUR128 SOUND1,-15,60,1
    SOUND1,-15,98,1
1080ENDPROC
1090X=2 Y=19 C$=A$(1) PROCdeal CSC=CSC+CV
1100PRINT TAB(6,28)"Computer's Score is ",CSC,
1110X=10 IF LEFT$(A$(1),1)="A"ORLEFT$(A$(3),1)="A"
    AND CSC<12 THEN F=10 PRINT" or ",CSC+10
1120 IF CSC+F>=PSC AND PNC<5 THEN PRINT TAB(6,28)"
    Computer Wins !" CW=CW+1 PROC_scores
    PROCbad PROCshuffle GOTO370
1130CARD=CARD+1 CNC=CNC+1 C$=A$(CARD) X=X+8
    PROCdeal E$=E$+C$
1140CSC=CSC+CV
1150E=0 PRINT TAB(6,28)"Computer's Score is ",CSC,
1160FORC%=1 TO LENE$ IFMID$(E$,C%,1)="A" AND
    CSC<12 THEN E=10 GOTO1180
1170NEXT
1180IF E=10 THEN PRINT " or ",CSC+10 GOTO1210
1190 IF CSC>21 THEN PRINT TAB(4,28)"
    OK YOU WIN !" PW=PW+1 PROCgood PROCscores
    PROCshuffle GOTO370
1200PRINT"          "
1210IF PNC=5 AND CNC<5 THEN GOTO 1130
1220IF CSC+E>=PSC THEN PRINTTAB(6,28)" Computer
    Wins !" CW=CW+1 PROCbad PROCscores
    PROCshuffle GOTO370
1230IF CNC=5 AND PNC<5 THEN PRINT TAB(6,28)" Five-
    Card-Trick,Computer Wins ! " PROCbad CW=CW+
    1 PROCscores PROCshuffle GOTO370
1240IF CNC=5 AND PNC=5 AND CSC<PSC THEN PRINT TAB
    (6,28)" Your Five-Card-Trick Wins !
    " PROCgood PW=PW+1 PROCscores PROCshuffle
    GOTO370
1250GOTO1130
1260DEF PROCscores
1270PRINTTAB(28,1)"Computer ",CW;TAB(28,3)"You ",PW
1280ENDPROC
1290DEF PROCshuffle
1300LOCAL C%
1310B$=""
1320FORC%=51 TO 0 STEP-1
1330B$=B$+A$(C%)
1340NEXT
1350ENDPROC
1360FORC%=0 TO CARD STEP2 IF LEFT$(A$(C%),1)="A"
    AND PSC<12 THEN PSC=PSC+10 PRINT TAB(6,15)
    "Your Score is ",PSC "        "
1370NEXT GOTO1090
1380DEF PROCgood
1390 SOUND1,-15,52,2 SOUND1,-15,100,2
    SOUND1,-15,148,2
1400ENDPROC
1410DEF PROCbad
1420SOUND1,-15,52,2 SOUND1,-15,4,2
1430ENDPROC
1440DEF PROCrules
1450VDU19,0,4,0,0,0 19,7,7,0,0,0,0 CLS
1460PRINT TAB(12,0) "PONTOON"
1470PRINT " The idea of pontoon is to beat the
    Dealer's score,however,if you only equal it the
    Dealer wins!"
1480PRINT'" You play first,but can see one of the
    Dealer's cards to help "
1490PRINT' TAB(7)"YOU MUST NOT SCORE OVER 21!"
1500PRINT '" An Ace counts as 1 or 11 whichever
    helps you most "
1510PRINT'" A Five-Card-Trick beats all,except a
    Five-Card-Trick scoring nearer 21 "
1520PRINT'" To deal yourself another card press'D'
    to stay with your present total press   'S'
    to stick
1530PRINT'"        "
1540ENDPROC
1550DEFPROCring
1560GCOL0 3
1570LOCALX%,Y%
1580FOR Y%=944TO432STEP-414
1590FOR X%=47TO1143STEP256
1600PLOT69 X% Y% DRAWX%+200,Y% DRAWX%+200,Y%-256
    DRAWX%,Y%-256 DRAWX%,Y%
1610NEXT NEXT
1620ENDPROC
```

Pontoon
*by Nigel Ferris*

## Nine Hole Golf

### on ZX81

Your ball is in the bottom left hand corner the hole is "H". You input a direction in angle eg 45 degrees and then an iron number. 1 = longest, 9 = shortest

```
 1 REM NINE HOLE GOLF
160 LET P$=
170 LET T=30
180 LET E =1
190 LET F =0
210 CLS
220 FOR I=5 TO 21
230 PRIN [illegible] AT N 2'
250 PRIN AT 5 N-4, [illegible] AT 21 ?
4
270 PRIN AT 5 N+10 [illegible] AT =1
+10,
290 LET [illegible]
300 PRINT AT 5 0 [illegible] AT 5 31
310 PRINT A 21 0 [illegible] AT 21 31
320 PRIN AT 2 0 TOTAL SCORE
0 PAR
330 FOR N=1 TO 9
340 PRINT AT 0,C HOLE N
350 LET =1
360 LET X=INT (7+RND*13)
370 LET Y=INT (1+RND*28)
380 IF ABS (Y J) 4 THEN GOTO 3
0
390 PRINT AT X, Y "H"
400 PRINT AT 0 15 SHOT NUMBER
 5
410 PRINT AT 2 28 T
420 PRINT AT I,J, O
425 PRINT AT 4 0 Q$
430 PRINT AT 3 0 "WHICH DIRECT
ON? (0 HORIZONTAL TO 90 VERTIC
L)
440 INPUT B
450 IF B =0 AND B<=90 THEN GOTO
460
460 PRINT AT 4,16, "ERROR RE-I
PUT"
470 GOTO 440
480 PRINT AT 3 0 Q$ Q$
490 PRINT AT 4 0 "WHICH IRON T
IS TIME? (1 TO 9)
500 LET A=10 (CODE INKEY$-28)
510 IF A 1 OR A>9 THEN GOTO 50
520 LET A=B*PI/180
530 LET C=INT (H*SIN C)
535 IF E 1 AND B>40 THEN LET E
1
540 LET F=INT (A*COS C
545 IF E - AND B 50 THEN LET E
1
550 IF I [illegible] THEN LET E=F
560 IF J [illegible] THEN LET E=E
570 PRINT AT I .
580 LET J=J+E
590 LET I=I+C
600 IF [illegible] THEN GOTO [illegible]
610 IF I 3 THEN GOTO [illegible]
620 IF J 1 THEN GOTO [illegible]
630 IF J>31 THEN GOTO [illegible]
635 LET J=30
640 GOTO 620
650 LET J=1
655 GOTO 680
660 LET I=20
665 GOTO 670
670 LET I=3
680 LET [illegible]
685 LET [illegible]
688 [illegible]
690 PRINT AT 3 0 OUT OF BOUND
- PENALTY SHOT ADDED
692 FOR [illegible]
695 NEXT
700 PRINT AT I [illegible]
710 LET T=T+1
720 IF I- AND J= THEN GOTO [illegible]
0
730 LET N=N+1
740 GOTO 400
750 PRINT AT 3 0 Q$ Q$
760 PRIN AT 3 [illegible] HOLE [illegible]
 SHOT
762 IF [illegible] THEN [illegible]
765 PRINT AT [illegible]
770 FOR I=1 TO 100
780 NEXT C
790 PRINT A [illegible]
800 NEXT
810 PRINT AT [illegible]
820 PRINT AT 4 [illegible]
ED IN [illegible] SHOT
```

**Nine Hole Golf**
*by Neil Hadgraft*

# OPEN FORUM

## Fruit machine

### on BBC

This program simulates a one armed bandit and will run only on the BBC B. The aim is to win as much money as possible: you win a pound for three 'Jackpots' of 30p for any other three of a kind. You have the option to hold a wheel at the end of each spin.

Line 470 should read

470 *Input* "Return to start" start

I have made much use of procedures

| | |
|---|---|
| *Procinst* | Instructions |
| *Procinitialise* | Sets up arrays and variables |
| *Procinput* | Place stake |
| *Procplay* | Main routine |
| *Procwheels* | Sets up screen and picks fruit |
| *Proccalculate* | Checks to see if player has won anything |
| *Prochold* | Asks the player if he wants to hold a reel |
| *Procpayout* | Prints win |

```
   REM FRUIT MACHINE SIMULATION
   REM WRITTEN BY NEIL McGLYNN
   REM VERSION [illegible] B"
   [illegible] IN BBC BASIC
   [illegible]
   [illegible]
   [illegible] initialise
   [illegible] input
   [illegible] play
   [illegible]
   [illegible]

   [illegible] initialise
   [illegible]
   [illegible]
   [illegible] random
   [illegible]
   [illegible] fruit$
   [illegible]
   [illegible] "LEMON", APPLE", BANANA",
   [illegible] F IT"
   [illegible]
   [illegible]
   [illegible]
   [illegible]
   [illegible] 10 PENCES DO YOU WISH
   [illegible]
   [illegible]
   [illegible]
   [illegible] INPUT [illegible]
   [illegible]
   [illegible] THENCLS [illegible]
   [illegible]
   [illegible]
   [illegible]
   [illegible] DEFPROCplay
   [illegible] UNgame=[illegible]
   [illegible] PROCwheel
   [illegible]    PROCcalculate
   [illegible]    PROChold
   [illegible]
   [illegible]
   [illegible]
   [illegible] PROCwheel=
   [illegible]     THENa$=fruit$(RND(6))
   [illegible]     THENb$=fruit$(RND(6))
   [illegible]     THENc$=fruit$(RND(6))
   [illegible]
   [illegible] "RETURN TO START" start
   [illegible]
   [illegible] PRINTTAB(5,[illegible]
   [illegible] "TO"
   [illegible] (RND(6)
   [illegible]
   [illegible] $,b$,c$
   [illegible] FOR delay=1 TO [illegible]
   [illegible] NEXT del
   [illegible] ENDPROC
570
580 DEFPROChold
590 REPEAT
600   INPUT"DO YOU WISH TO HOLD ANY REELS
      (YES OR NO)",ans$
610IF ans$="NO"THEN ENDPROC
620UNTILans$="YES"ORans$="NO"
630LETwheelie=0
640REPEAT
650INPUT"REEL 1  (Y OR N)"reelone$
660IF reelone$="Y" THEN[illegible]=1
670IF reelone$="Y"THENwheelie=wheelie+1
680UNTILreelone$="Y"ORreelone$="N"
690REPEAT
700INPUT"REEL 2 ?(Y OR N)"reeltwo$
710IF reeltwo$="Y" THENwheelie=wheelie+1
720IF reeltwo$="Y" THEN[illegible]=1
730IFwheelie=2THEN ENDPROC
740UNTILreeltwo$="Y"ORreeltwo$="N"
750REPEAT
760INPUT"REEL [illegible]
770IF reelthree$=[illegible]
780UNTIL[illegible]
[illegible] ENDPROC
[illegible]
[illegible] PROCcalculate
[illegible] IF [illegible] ENDPROC
[illegible] THEN ENDPROC
[illegible] IF [illegible] JACKPOT THENpayout=payout+[illegible]
    ELSEpayout=payout+[illegible]
850 ENDPROC
860
870DEFPROCpayout
880 CLS
890   PRINTTAB(0,5);"YOU HAD ";pull;"
      PULLS"
900PRINTTAB(0,7);"YOU WON ";payout;"
      PENCE"
910FOR delay=1 TO 1000
920NEXT delay
930 ENDPROC
940DEFPROCinstr
950CLS
960PRINT"       FRUIT MACHINE SIMULATION"
970PRINT
980PRINT
990PRINT"  YOU WILL BE ASKED HOW MANY 10
     PENCES  YOU WISH TO GAMBLE. INPUT A
     VALUE BETWEEN 1 AND 5.FOR EACH 10PENCE
     YOU GET 2 PULLS ON THE MACHINE.
     WHEN YOU ARE ASKED TO HOLD  "
1000PRINT"A REEL JUST FOLLOW THE
     INSTRUCTIONS ON  THE VDU."
1010PRINT"YOU CAN ONLY HOLD A MAXIMUM
     OF 2 REELS"
1020PRINT
1030PRINT
1040PRINT"                GOOD LUCK!"
1050FOR f=1 TO 10000
1060 NEXT
1070 ENDPROC
1080
```

***Fruit Machine***

*by Neil McGlynn*

## Joystick

This program brings the Dragon's listing facility under joystick control. After typing in and *Running*, the program can be deleted. Any program now typed in will list at full speed with the righthand joystick fully forward, and progressively more slowly as the joystick is pulled back. The listing can be stopped completely by pressing the fire button on the joystick.

```
10 ***********************
20 *** JOYSTICK LISTING ***
30 ***     CONTROL      ***
40 ***********************
50 * (C)1984  DON EDWARDS *
60 ***********************
70 CLEAR200,&H7FC7
80 FORN=&H7FC0 TO &H7FFF
90 READ A:POKE N,A
100 NEXTN
110  DATA 142,127,212,191, 16
120 DATA 104,134,126,183,  1
130 DATA 103, 57, 52,127,109
140 DATA 128, 18,190   1, 91
150 DATA  48,  1, 40, 31,102
160 DATA 255,  0,129,126, 39
170 DATA  12,129,254, 39,  8
180 DATA 140,  0,  0, 46,238
190 DATA  53,127, 57,182,255
200 DATA   0,129,127, 39,  4
210 DATA 129,255, 38,245, 32
220 DPTA 230
```

**Joystick**
*by Don Edwards*

## Microradio

GW6JJN

### Baudot code

A few weeks saw the third Swansea Bay Microshow. The event, now an annual fair held at the Swansea Leisure Centre, held several attractions for the radio-computer hobbyist. One of the stands was occupied by the Swansea Amateur Radio Society who were demonstrating the use of a home computer programmed to send radio-teletype (RTTY).

The operator, Richard GW8TVX, was using his Dragon 32 to contact other RTTY stations around the world. The Dragon was used in conjunction with a machine code program to encode and decode the Amateur Baudot RTTY standard, as mentioned in Microradio a few weeks ago.

Also in use was a serial to parallel interface plugged into the cartridge port. The necessary tones were generated by a home-made modem and fed into a Trio shortwave transmitter.

On screen, the conversation being received was displayed in the upper part of a split-screen system. As this displayed the incoming text, the operator was able to compose a reply which was stored in a buffer and when the other station handed over, all that was necessary to send the stored reply was a simple keypress.

Also stored in the program were various pages written by the operator about such things as the local weather, the equipment in use and the Swansea Bay Microshow details.

An interesting and useful feature of the Dragon program was a visual indication of the reception of the high and low tones of the Baudot code. This made it a simple matter to tune the radio receiver to the optimum reception of the distant station.

During the time that Richard kindly allowed me to use the station, I managed to speak via the Dragon, to amateurs in such places as Sweden, Germany and Switzerland on the 20 metre (14Mhz) band.

Many thanks to Richard and the Swansea Amateur Radio Society for demonstrating and allowing me to use their excellent system.

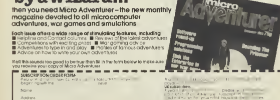
Next week, I shall attempt to answer some of your many letters. If there are any questions that you need answering, or any suggestions about topics you would like to see dealt with in Microradio, then please drop me a line. ■

**Ray Berry GW6JJN**

[illegible]


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## Collective misery

This week in the corner the Grand Elf and I are going to look at some of the letters we have had during the past couple of months — and my apologies now for not answering some of your letters sooner

I've had several letters regarding an adventure for the Spectrum, which I think has been rather underrated (although the sales figures may prove me wrong!) This is *Quest* from Hewson Consultants It's a nice mixture of traditional adventure with lots of spells and Dungeon and Dragon-style monster-bashing, including a rating system which starts you off as *Cave Crawler*

Ian Ritchie writes from Belfast "I can achieve the rating of Dwarf Dodger which is about 240 points out of the maximum 600 First of all I cannot find the magical properties of the ring (which I found shortly after destroying the rat) nor can I find out how to cross the river which is just south of a dwarf However, probably my biggest problem lies in trying to get back along my route having found the great sword and the scroll, underground I have read the "Scroll Book" which says that the "Tree = Vampire" which I cannot find the solution to The key to open castle cops (south of the Black Hobbit) never seems to be anywhere — I only found it once I hope you can help me in some way, as I am being confused by a very detailed, interesting adventure"

Alan and Daphne Davis, from Lancaster wrote to me some weeks ago about their experiences with *The Hobbit* and have recently written another very interesting letter about *The Quest* "With a score of 365 we have achieved a rating of 'adventurer second class" We now have a hut full of vases chalices rings and bracelets, and the countryside is littered for miles around with dead bodies (we made better progress as a wizard than a fighter)

We have the scroll but its message (what is needed is a quick change) baffles us We have the long key and have unlocked the castle door but we can't open it or get in The trapdoor, though not locked can't be opened

"Don't trust the wizard in the study — he appears to be a charlatan! You pay him your hard-earned gold and get nothing! Worse still, the programmer is also a rogue — the hint here is pay him !

'Some of the mazes are positively criminal We spent hours wandering around them, dropping objects and mapping them out — and this is essential if you're to be able to move freely around the world We think this is a truly excellent program — difficult full of surprises and completely baffling even now we've come so far

As you can see from these letters *The Quest* is an absorbing adventure, well worth a place in the Spectrum owner's library The Davis' letter contains some valuable hints on solving the mazes and in a later corner I'll go into them in more detail (notice the good advice about dropping objects in a maze — often the only way you can find your way around) In the meantime, if anyone out there can help us in our collective misery

Please can you give me all available help on one of the most frustrating adventure programs I have ever tried It is, of course, Artic's *Ship of Doom* I am really beginning to think that it is impossible to get the key from the glass cover Also I cannot understand what purpose the body in the block of ice can possibly serve as it seems impossible to break, thaw or do anything with This program is driving me insane — is it possible to get any further help? PS Do Artic know all the clues I wonder?" writes L J Rogers of London N1

"Can you give me some advice as to how to progress in Artic's *Ship of Doom*? How do I power the rod? How can I get the key? I have all the objects to be found in the immediately accessible rooms," echoes Marcus Groan of Bristol

P Miller of Weymouth, is another of the many stuck in the same place These letters are just some of many I get about Artic's adventures They are notoriously difficult However they are strangely enough ideal for the beginner and are the first programs seen by many of us Sinclair adventurers — they have been around for an eternity (well, at least four years!)

On to the problems — regular readers of the corner will recognise the code that follows starting from the second letter, read off every other letter When you reach the end return to the first letter, and repeat the process To get the key from the glass cover and to power the rod

RIONDS+EPROTIBNATTSTOENRICYAITNCTOOV
REOR

Meanwhile J Crokell of Lancaster is playing *Planet of Death* and is stuck at the forcefield — neither can he get the coin from the lake Try this first

TWOEGAERTSCOOCITNS

and at the forcefield

CFEI+RTEHLEANSDEARNTCWEI

Incidentally Artic are quite happy they tell me to send a Help Sheet to anyone who finds themselves inextricably stuck in one of their adventures Send a SAE to Artic Computing, 396 James Reckitt Avenue Hull N Humberside ■

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## ATARI JOYSTICK

*M E Ramsden of Overthorpe Road Thornhill Dewsbury West Yorkshire writes*

**Q** **I have owned an Atari VCS video game for nearly two years now and I have finally decided to sell the Atari and buy a brand new Dragon 32 But I would like to know whether the joysticks from the Atari will fit the Dragon. If they don't, do you know of an adaptor of some sort that will enable the joysticks to operate on the Dragon computer?**

**A** Yes they can be used but a special Interface is needed One is available from Cotswold Computing, who incidently also do an interface that allows the Wico Track Ball for the Atari to be used on the Dragon Cotswold Computing can be found at 6 Middle Row Chipping Norton Oxfordshire The price of the joystick interface is £14 95

## PROGRAM BREAKER

*Kulvinder Singh of Vaughan Road Willenhall West Midlands writes*

**Q** **I have written a few programs for myself on my BBC micro (B), and would be interested to hear from you if you could help and tell me how to stop them from being broken into and listed — except, of course, by myself.**

**A** Unfortunately, in the final analysis, any program that has been written can be broken However you can make it difficult You could use some sort of *On Error Goto* where pressing the *Escape* for example produces an error, thus overriding it If you have the 1 2 Operating system, the following call will disable the *Escape* key *FX 221 1

## DIL SOCKETS

*Michael Bromwhich of Kirby Hill, Braddon Isle of Man, writes*

**Q** **There are a few points that puzzle me about the BBC model B**

**1) What are the DIL sockets on the left of the keyboard for? Are they for ROM chips, for languages other than Basic Can they be used to program Eproms?**

**2) Is it true that there is an analogue interface on the boar of the computer? If so would it be possible to connect analogue devices such as thermistors to the BBC micro directly?**

**3) I remember seeing op-code mnemonics in Basic listings for the BBC If another processor was connected by the tube could it be addressed in a similar way?**

**4) In some adverts I have seen the BBC has background and eight foreground colours. Are the foreground colours the same as the background colours, or are there 16 colours?**

**A** Two questions here about the DIL sockets and as they seem to cover areas which interest several people it seems sensible to deal with them both at once

The Dip In Line (DIL for short) sockets are for a set of micro switches that can help you pre-set certain features on your keyboard They represent a single byte of eight bits The bits have the following functions

0 – 2 Select the Mode
3 Allows you to boot from Disc
4 – 5 This sets the disc timing for disc drives other than Acorn s own
6 – 7 These two bits are not used

Obviously these sockets cannot be used to program Eproms or anything like this

As for your other questions, the BBC has four analogue ports at the back which makes it compatible with a very wide selection of analogue devices

I can only assume that Mnemonics and code that you saw for the BBC were for the onboard 6502 processor Obviously if you used the tube to connect up a further 6502 then there should be little problem But what would happen if for example you had a Z80 connected via the tube? The BBC (6502) code would be of no use whatsoever Machine code is entirely dependent on the specific processor, and while there may be similarities within a family, there is no compatibility Any code would have to be written for the specific processor Finally the BBC only has eight colours, which can be either foreground or background colours

## A HIGH PRICE

*Graham Freestone of Knights Avenue Haverhill Suffolk writes*

**Q** **I am the owner of a TI 99/4a, and would like to know whether I can use my school Epson MX 80 printer with my computer? I ask because I have to produce listings and *Runs*, for my O-level computer studies course.**

**A** One of the reasons for the failure of the TI 99/4a is the very high price of peripherals and cartridges Atari have met a similar problem, where the British market is less willing to accept a situation where once they buy a computer they are locked into having to deal with only the manufacturer and perhaps a small group of outside suppliers who can then charge what they like, or what they think the market will accept This is one of the major question marks over the new Sinclair QL Good as it is the only way to *Load/Save* programs is on Microdrive It goes without saying that there is only one source of microdrive cartridges

It is quite possible to use a TI with a printer but in fact both a buffer board and interface are needed' The combined cost is approaching £250 I tried to get current prices from no less than five shops in Tottenham Court Road recently None of them stocked TI peripherals and doubted whether or not they would now be readily available They were just selling the computers There might be a chance that you could get what you need if you could find a dealer selling off old stock I would further suggest that you obtained a Centronics port or else there might be even more cost as you find yourself having to add an RS232 interface to the printer

Failing this, then a new computer might well be the answer The BBC will interface to most common printers by the simple expedient of a ribbon cable

## MEMORY TRANSFER

*Paul Rogers of Lowcroft Ashurst Estate Skelmesdale, writes*

**Q** **I have a Dragon 32, and I would like to know if a Rom cartridge program remains in the computer once the cartridge is removed?**

**A** No I am afraid that if you take out the cartridge then you lose the program The Rom in the cartridge (there can be Ram as well) does not transfer its contents to the memory space of the Dragon

As for stacking several cartridges together, it would depend on where they are mapped into the Dragon's memory If, for example, two cartridges were both mapped into the Rom addresses of the Dragon, then not only would they override the onboard Rom but they would also clash with each other Your best hope is a mother board I do not know of one for the Dragon, though Wessex produce an expansion board capable of having an extra 64K slotted in

**Is there anything about your computer you don't understand, and which everyone else seems to take for granted? Whatever your problem *Peek* it to Ian Beardsmore and every week he will *Poke* back as many answers as he can. The address is *Peek & Poke*, *PCW*, 12-13 Little Newport Street, London WC2R 3LD.**

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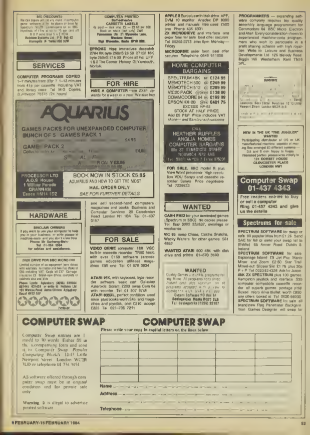
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# NEW RELEASES

## HIGH STAKES

*Play for Planets* is a version of Pontoon where the stake is planets rather than pence

You can play against the computer and other players and the program allows you to do things like shuffle the cards or even change the pack

Unlike some versions of the game on computer this one also has the authentic feature of allowing you to 'buy' additional cards to increase your stake

| | |
|---|---|
| **Program** | *Play for Planets* |
| **Price** | *£4 95* |
| **Micro** | *Spectrum 48K* |
| **Supplier** | *Sugar Loaf Software, 14 Maryhill Road, Glasgow G20 PZ* |

## ROLE CONFUSION

Things are getting crowded in the *Donkey Kong* department Ocean had a great deal of success with their version of this famous game on the Spectrum and now Artic have joined the fray with *Monkey Bizness*

This version has all the main features of the original including ladders hammers fire balls, and helpless female in the clutches of a deeply Freudian monkey Can you (a man, of course) save her?

There are eight levels all together with various new problems in each — level eight has some weak points in the scaffolding, other levels have springs that throw the barrels upwards

In the promo blurb it says that you are a butcher boy and the girl is your queen, whether this mixed metaphor and confusion of roles is specifically relevant I know not

| | |
|---|---|
| **Program** | *Monkey Bizness* |
| **Price** | *£5 95* |
| **Micro** | *Spectrum 48K* |
| **Supplier** | *Artic Computing, Main Street, Brandesburton, Driffield YO25 8RL* |

## ENTERTAINING

At £3 99 for three machine code games it would perhaps be a bit churlish to complain that all the games are based on the ancient *Breakout* formula

*Brick Wars* contains *Genesis* (*Breakout*) *The Brick Strikes Bat* (*Breakout* where you must also avoid bricks that come straight for you) and *Return of the Brickie* (a sort of competitive *Breakout* where a brickie is trying to rebuild the wall)

In fact the programs are very well done and enough changes are rung on an old theme to justify their release here More entertaining than many, seemingly more original, games

| | |
|---|---|
| **Program** | *Brick Wars* |
| **Price** | *£3 99* |
| **Micro** | *Spectrum 16/48K* |
| **Supplier** | *Paul Cook Software, 548 Great Horton Road, Bradford BD7 3HG* |

## PYRAMID GAME

One of the most frequently down-loaded Micronet games for the BBC is *Q Man* by MRM Software For a mere £3 you can get a very faithful copy of the bizarre *Q Bert* game that dominated the arcades

On the strength of its success, MRM has decided to release this and other popular games on conventional cassette so that modemless people can join in the fun

The game involves a little cartoon character with a funny nose who bounces around a pyramid of bricks Whenever he lands on a previously unbounced on brick it changes colour — the idea of the game is to land on every brick

However, nameless shadowy nasties are concerned to keep the little thing from its task by rolling boulders down at him — there is also a poisonous snake that lurks on the bricks and sometimes pounces It's a good game well copied and (for a limited period only) it retails for an unbelievable £4 95

| | |
|---|---|
| **Program** | *Q Man* |
| **Price** | *£4 95 (+ 55p P+P)* |
| **Micro** | *BBC B* |
| **Supplier** | *MRM Software, 17 Cross Coates Road, Grimsby, South Humberside* |

## HEROIC STUFF

Angels one five, tally ho, look out, Chalkie, there's a bally 109 on your tail! if we don't make it, sir would you go round and see my old woman? She'd think a lot of that she would My God the bally boffins were right after all the dam's going! (amazed silence followed by military music)

If this sort of thing appeals to you and fires your imagination, then you've probably seen the film too — now you can play the game in *Dambusters* by Alligata Software

In this game you must pilot your bomber low over the Rhine lands to the Möhnesee Dam avoiding anti aircraft fire and enemy fighter planes once there you must match up the search lights (just like the real thing) to pin point the exact point to release your bouncing bomb Heroic stuff

| | |
|---|---|
| **Program** | *Dambusters* |
| **Price** | *£7 95* |
| **Micro** | *BBC B* |
| **Supplier** | *Alligata Software, 178 West Street, Sheffield S1 4ET* |

## FREE RIDE

More *Q Bert* impersonations — this time from Automata who has mutated the game to suit its own weird obsessions

Like the original it's all about bouncing from brick to brick on a pyramidal structure dodging various things that are coming for you

However, aside from the balls there are all kinds of other problems for you to tackle — one is another creature that turns pyramid bricks back to their original colour

The Pi-man is not entirely blameless — this previously only slightly shoddy supporter of the free and defender of the brave has now joined the enemy and is actively involved in ensuring your demise

Other features in the game include some escape discs that will give you a free ride to the top of the pyramid if things get too hot — there are also various other nasties that drop from time to time

In the past Automata's programming has tended to leave something to be desired in the technical department — whatever its other merits — but this game is a real departure

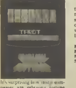
The quality of the graphics and the slickness of the movement are comparable with Ultimate — watch what happens

when you jump on one of the ascending saucers

The flip music B side is a bizzare reggae mish-mash, but it sounds as if Automata have bought some expensive musical equipment — they must be doing well

| | |
|---|---|
| **Program** | *Pi balled* |
| **Price** | *£6 00* |
| **Micro** | *Spectrum 48K* |
| **Supplier** | *Automata<br>27 Highland Road<br>Portsmouth<br>Hants PO4 9DA* |

## SYMBOLIC




It's surprising how many companies are releasing fortune telling programs for home micros — you'd have thought mysterious ancient wisdoms and modern technology would mix about as well as oil and water

*Tarot* is the latest in this genre and includes some excellent graphics to depict the various symbolic pictures — the 48K version does this for the entire 78 card pack

As you might expect, you deal the cards and can ask specific questions the cassette inlay contains stern warnings about the immutability of fate

The program also contains a 16K version and comes packaged with a Penguin paperback which explains what it's all about Personally I'm waiting for a tea leaves simulator

| | |
|---|---|
| **Program** | *Tarot Card* |
| **Price** | *£12 95* |
| **Micro** | *Atari* |
| **Supplier** | *English Software<br>Box 43<br>Manchester M60 3AD* |

## MORE SPEED

Maybe they've all bought other, more conventional machines but I'm sure there must still be a few people around with a Jupiter Ace bemoaning and bewailing the lack of software

For this reason I thought I would mention Plasma Software who are one of the small companies still producing games for the machine

*Moonbuggy* is a simplified version of the arcade game — you have a buggy which you must guide over various different types of terrain whilst avoiding rocks potholes, mines and aliens

Although Forth is very fast, this game is partly written in machine code for more speed still. With all of Plasma's games only costing £4 95, it could be worth dusting down that funny little white plastic box again

| | |
|---|---|
| **Program** | *Moonbuggy* |
| **Price** | *£4 95* |
| **Micro** | *Jupiter Ace (16K)* |
| **Supplier** | *Plasma Software<br>32 Bayview Road<br>Bangor<br>Co Down<br>Northern Ireland<br>BT19 2AR* |

## COSMIC TRADER

*Star Trader* is a trading game with the cosmos as your supplier and a starship as your delivery van

You must purchase a computer urgently needed on earth (a man or woman of honour obviously, you can t just steal it ) To buy it you will need to mine for rare minerals and trade them with other races in the galaxy

Aside from making sure nobody rips you off, you will need to maintain your supplies of basic commodities like food, air and fuel The screen display keeps you up to date with how much of everything is left and where in the universe the next goodies are to be found

| | |
|---|---|
| **Program** | *Star Trader* |
| **Price** | *£7 95 (+ 50p+p)* |
| **Micro** | *BBC B* |
| **Supplier** | *FBC Systems Ltd<br>10 Castlefields<br>Main Centre<br>Derby DE1 2PE* |

## BASIC MATHS




Stell Software are one of a growing number of companies who are specialising in providing educational programs for the popular home micros

*Maths Invaders* takes the theme of the old arcade hit and uses it to test basic maths in the age range of 4 to 12 To shoot at the rows of invaders that are shuffling down the screen you must discover the right answer to a maths problem and 'load' your gun with it

The program allows for a wide variation in abilities, with 50 speed levels and nine difficulty options

| | |
|---|---|
| **Program** | *Maths Invaders* |
| **Price** | *BBC B/Electron* |
| **Micro** | *£6 95* |
| **Supplier** | *Stell Software<br>36 Limefield Avenue<br>Whalley<br>Lancs BB6 9RJ* |

## DOUBLE DEAL

*Jokers Wild* is one of the first Spectrum offerings in Phoenix Software's double Adventure/Arcade package systems

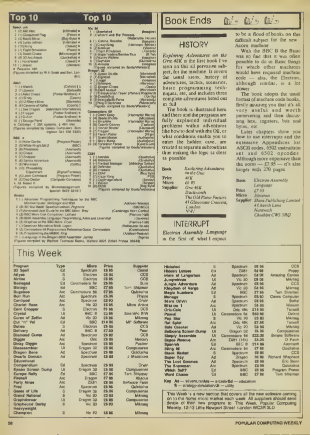
There are two programs, an arcade style game and an adventure game — you must master the first to get clues and the start code to the latter

The arcade game is basically a maze chase game where you must run around a series of chambers getting cards of each suit — each chamber will only let you enter if you have passed over an appropriate key All the while you are chased by a sullen looking king's head It's fast and quite addictive

worth playing — the setting is a mysterious funfair where the jollity is strictly limited On the 48K version the locations are all illustrated with simple, but effective drawings well up to Digital Fantasia standard Recommended

| | |
|---|---|
| **Program** | *Jokers Wild* |
| **Price** | *£9 95* |
| **Micro** | *Spectrum 16/48K* |
| **Supplier** | *Phoenix Software<br>Spangles House<br>116 Marsh Road<br>Pinner<br>Middlesex* |

New Releases is designed to let people know what software is coming on to the market If you have a new game or utility which you are about to release send a copy and accompanying details to New Releases, Popular Computing Weekly 12-13 Little Newport Street WC2H 3LD.



## Top 10

**Spectrum**
1 (2) Atic Atac (Ultimate) *
2 (1) Chequered Flag (Psion) *
3 (5) Manic Miner (Bug-Byte) *
4 (4) Lunar Jetman (Ultimate) *
5 (10) Kong (Ocean) *
6 (7) Flight Simulation (Psion) *
7 (3) Death Chase (Micromega) *
8 (8) 3D Ant Attack (Quicksilva) *
9 ( ) Hunchback (Ocean) *
10 ( ) Jetpac (Ultimate)
* Requires 48K
(Figures compiled by W H Smith and Son, London)

**Atari**
1 ( ) Warlok (Calisto) † ‡
2 (1) Zaxxon (Datasoft)
3 ( ) Astro Chase (Parker Brothers) *
4 (7) Slinky (Cosmi)
5 (3) O Riley's Mine (Starcade)
6 (9) Caverns of Kafka (Cosmi) †
7 ( ) Sea Dragon (Adventure International)
8 ( ) Frogger (Parker Brothers) *
9 ( ) Q-Bert (Parker Brothers) *
10 ( ) Savage Pond (Starcade)
* Cartridge † 32K cassette. ‡ 48K disc
(Figures compiled by Calisto Computers Birmingham 021 632 6458)

**BBC** *
1 (1) Killer Gorilla (Program Power)
2 (3) White Knight Mk 2 (BBC)
3 (8) Planetoids (Acornsoft)
4 (6) Chess (Acornsoft)
5 (7) Snapper (Acornsoft)
6 (8) Sphinx Adventure (Acornsoft)
7 (8) Wordwise (Griffin)
8 (10) Philosophy Experiment (Digital Fantasia)
9 (4) Laser Command (Program Power)
10 (2) Disc Doctor (Computer Concepts)
* All Model B
(Figures compiled by Micromanagement Ipswich 0473 59181)

**Vic 20**
1 ( ) Bewitched (Imagine)
2 (1) Wizard and the Princess (Melbourne House)
3 ( ) Catcha Snatcha (Imagine)
4 ( ) Crazy Kong (Interceptor Micros)
5 (2) Sneaker (Visions)
6 ( ) Flight Simulation (Ferranti)
7 (3) Super Vaders/Bomber Run (K Tel)
8 ( ) Wacky Waiters (Imagine)
9 ( ) Skyhawk (Quicksilva)
10 (6) Arcadia (Imagine)
(Figures compiled by Boots/Websters)

**Dragon 32**
1 (4) Space Shuttle (Microdeal)
2 (1) Eightball (Microdeal)
3 ( ) Loggir (Imagine)
4 ( ) [illegible] (Microdeal)
5 (2) Dragon Chess (Oasis)
6 (5) Devil Assault (Microdeal)
7 ( ) Transylvanian Tower (Richard Shepherd)
8 (8) Dream Bug (Kenilo)
9 (9) Intergalactic Force (Microdeal)
10 ( ) Ring of Darkness (Wintersoft)
(Figures compiled by Boots/Websters)

**Commodore 64**
1 (–) Crazy Kong (Interceptor Micros)
2 (4) Space Shuttle (Microdeal)
3 (–) Siren City (Interceptor Micros)
4 (8) Cosmic Convoy (Taskset)
5 (–) Hover Bovver (Llamasoft)
6 (7) Frogger (Interceptor Micros)
7 ( ) Falcon Patrol (Virgin)
8 ( ) Grand Master (Audiogenic)
9 (–) Micro Mania (Audiogenic)
10 (3) Forbidden Forest (Centre Soft)
(Figures compiled by Boots/Websters)

**ZX81**
1 (1) Astroids (Quicksilva)
2 (4) Scramble (Quicksilva)
3 (–) Football Manager (Addictive Games)
4 (2) Defender (Quicksilva)
5 (8) Invaders (Quicksilva)
6 (–) ZXAF (Bug Byte)
7 (7) Krazy Kong (PSS)
8 (–) Espionage Island (Sinclair)
9 ( ) VuCalc (Sinclair)
10 (6) ZXDB (Bug-Byte)
(Figures compiled by Boots/Websters)

**Books**
1 ( ) Advanced Programming Techniques for the BBC Microcomputer *McGregor and Watt* (Addison-Wesley)
2 (8) 30 Hour Basic Spectrum edition *Prigmore* (BBC/NEC)
3 (1) Advanced User Guide for the BBC Micro *Bray* (Cambridge Micro Centre)
4 (5) BBC Micro Disk Companion *Latham* (Prentice Hall)
5 (9) 6800 Assembly Language Programming, *Astro and Leventhal* (Osborne)
6 (4) Graphics on the BBC Micro *Cryer* (Prentice Hall)
7 ( ) Spectrum Microdrive Book *Logan* (Melbourne House)
8 (2) Commodore 64 Programmers Reference Guide *Commodore* (Commodore)
9 (6) Programming the M6800 *King* (Addison-Wesley)
10 ( ) Language of the Dragon-6809 Assembler *James* (Sigma)
(Figures compiled by Watford Technical Books, Watford 0923 23994 Prestel 36644)

## Book Ends

### HISTORY

*Exploring Adventures on the Oric 48K* is the first book I've seen on this all pervasive subject, for the machine It covers the usual areas, history of adventures, tactics, scenarios, basic programming techniques, etc, and includes three complete adventures listed out in full

The book is illustrated here and there and the programs are fully explained individual problems within adventures like how to deal with the Oil, or what conditions enable you to enter the hidden cave, are treated as separate subroutines thus making the logic as clear as possible

| | |
|---|---|
| **Book** | *Exploring Adventures on the Oric* |
| **Price** | *48K* |
| **Micro** | *£6 95* |
| **Supplier** | *Oric 48K*<br>*Duckworth*<br>*The Old Piano Factory*<br>*43 Gloucester Crescent,*<br>*London*<br>*NW1* |

### INTERRUPT

*Electron Assembly Language* is the first of what I expect to be a flood of books on this difficult subject for the new Acorn machine

With the BBC B the Basic was so fast that it was often possible to do in Basic things for which other machines would have required machine code — alas, the Electron, although similar, is a lot slower

The book adopts the usual format of machine code books, firstly assuring you that it's all very useful and worth persevering and then discussing hex, registers, bits and bytes, etc

Later chapters show you how to use interrupts and the extensive Appendices list ASCII codes, 6502 instruction set and 6502 opcodes Although more expensive than the norm — £7 95 — it's also longer with 270 pages

| | |
|---|---|
| **Book** | *Electron Assembly Language* |
| **Price** | *£7 95* |
| **Micro** | *Electron* |
| **Supplier** | *Shiva Publishing Limited*<br>*4 Church Lane*<br>*Nantwich*<br>*Cheshire CW5 5RQ* |

## This Week

| Program | Type | Micro | Price | Supplier |
|---|---|---|---|---|
| 3D Spell | Ed | Spectrum | £6.95 | Camel |
| Abyss | S | Electron | £6.95 | CCS |
| Airline | S | Electron | £6.95 | CCS |
| Besieged | Ed | Commodore 64 | £6.95 | Sulis |
| Biology | Ed | BBC | £7.95 | Tom Shipman |
| Bugaboo | Arc | Commodore 64 | £7.95 | Quicksilva |
| Bull Run | Arc | Spectrum | £5.95 | Phipps |
| Centipod | Arc | Spectrum | £6.90 | Orwin |
| Chariot Race | Arc | Vic 20 | £6.95 | Micro Antics |
| Corn Cropper | S | Electron | £6.95 | CCS |
| Crystal | Ut | BBC B | £3.95 | Scientific B/W |
| Curse of Zeffin | Ad | Vic 20 | £6.95 | Mikmag |
| Cut "n" Val | Ed | BBC | £14.95 | MP Software |
| Delios | S | Electron | £6.95 | CCS |
| Delivery | Ad | BBC B | £7.50 | Pean |
| Diamond Cures | Ad | Spectrum | £6.00 | CCS |
| Digger | Arc | Oric | £6.95 | Mercury |
| Dinky Digger | Arc | Spectrum | £6.95 | Postern |
| Disassembler | Ut | Dragon 32 | £6.95 | Compusense |
| Dragon Bane | Ad | Spectrum | £6.95 | Quicksilva |
| Dwarfs Domain | Ad | Spectrum | £6.00 | J Maddocks |
| Educational Compendium | Ed | Spectrum | £6.00 | Orwin |
| Epson Screen Dump | Ut | Dragon 32 | £6.95 | Compusense |
| Europe Rally | Ed | BBC | £7.95 | Tom Shipman |
| Fireball | Arc | Dragon | £7.95 | Abacus |
| Forty Niner | Arc | ZX81 | £6.95 | Software Farm |
| Fred | Arc | Spectrum | £6.95 | Quicksilva |
| Game of Life | S | Dragon 32 | £5.95 | Compusense |
| Grand National | S | Vic 20 | £3.00 | Mikmag |
| Graphdrawer | Ut | Dragon 32 | £6.95 | Compusense |
| Greyhound Derby | S | Vic 20 | £6.90 | Mikmag |
| Heavyweight Champion | S | Vic 20 | £6.95 | Mikmag |
| Hickstead | S | Spectrum | £6.95 | CCS |
| Hidden Letters | Ed | ZX81 | £4.95 | Poppy |
| Mare of Langerhan | Ad | Spectrum | £4.00 | Amazing Games |
| Jumprunner | Ut | Vic 20 | £6.00 | Mikmag |
| Jungle Adventure | Ad | Spectrum | £6.95 | CCS |
| Kingdom of Vargo | Ad | Vic 20 | £4.95 | Mikmag |
| Magic Numbers | Ed | BBC | £7.95 | Tom Shipman |
| Menage | S | Spectrum | £9.90 | Cases Computer |
| Mare Drivin | Ad | Spectrum | £6.95 | Beffel |
| Mission 1 | Arc | Spectrum | £6.95 | Mission |
| Oric-Calc | Ut | Oric 48k | £14.95 | Tansoft |
| Pascal | Ut | Commodore 64 | £49.95 | Oxford |
| Pop Star | S | Vic 20 | £3.90 | Mikmag |
| Rat Splat | Arc | Oric 48k | £7.95 | Tansoft |
| Safe Cracker | Ad | Vic 20 | £4.95 | Mikmag |
| Seikosha Screen Dump | Ut | Dragon 32 | £5.95 | Compusense |
| Simply Assemble | Ut | Commodore 64 | £22.00 | Simple Software |
| Space Rescue | Arc | ZX81 (16k) | £4.25 | D Pinch |
| Spanish | Ed | BBC B | £14.95 | Acornsoft |
| Sting 64 | Arc | Commodore 64 | £7.95 | Quicksilva |
| Stock Market | S | Spectrum | £8.90 | CCS |
| Super Spy | Ad | Dragon | £6.90 | Richard Shepherd |
| The Lost Gnomes | Ad | Spectrum | £8.95 | Eric Benn |
| The Snowman | Arc | Spectrum | £6.95 | Quicksilva |
| Which Salt? | Ed | BBC | £6.95 | Program Power |
| Word Chaser | Ed | BBC | £7.95 | Tom Shipman |

Key Ad — adventure/Arc — arcade/Ed — education/
S — strategy-simulation/Ut — utility

This Week is a new section that covers all the new software coming on to the home micro market each week All suppliers should send details of their new programs to This Week, Popular Computing Weekly 12-13 Little Newport Street London WC2R 3LD

# Ziggurat



## No excuse

I expect that you are familiar with the various surveys which report that women and young girls constitute a minute percentage of home computer users. Why is it a male dominated hobby and why should women be left behind as a new world of home computing approaches? Surely some mistake, methinks!

Some software houses have looked with interest at the idea of cracking this potentially huge market. However, it is not as simple as writing games that girls enjoy. Personal experience has shown me that the whole family can greatly appreciate existing games such as *Manic Miner* and *Jumping Jack*, even if some of the cruder shoot-em-ups are less popular.

There is one change, however, that can be easily identified and should be dealt with — there is no excuse for computer games to be insulting to females and perpetuate the invidious stereotypes of "feeble women" that the other forms of media had largely to forsake many years ago. I am not referring to the inevitable small ads but to the mainstream of games software which includes some outrageously offensive things.

Arcade games must be the most frequent, if not the worst, culprits in the way that women are usually shown as pathetic creatures worthy only of rescue by the intelligent and resourceful man. Of course this is usually all in fun — as in the various versions of *Donkey Kong*.

It is refreshing to see the arrival of some non-sexist arcade games. One of the best must be *3D Ant Attack* by Quicksilva's Sandy White. Here you are given the option of choosing a man rescuing a woman or a woman rescuing a man. As a man, once you have played the part of the helpless victim for a few games, you begin to get a faint flavour of how irritating it is always to be regarded as the helpless sex.

Since *Mrs Mopp* from Computasolve for the 48K Spectrum was written by a woman, I hope it is a sarcastic look at a housewife's life rather than an attempt to produce a game women can identify with. Playing the title role in this game, you are confronted with a huge and ever increasing heap of household junk to collect such as cups which must be washed at the sink and clothes for the washing machine. Finally, and understandably, Mrs Mopp has enough and leaves home.

I once read that detective stories appealed to women because they enjoyed the orderliness and sense of logic involved in spotting whodunnit. This immediately suggests to me that there could be a market amongst women for well written adventure games. How unfortunate then that adventures contain some of the most adolescent material and insulting writing of any computer games. The worst example I can think of is Artic's early attempt, *Ship of Doom*. Any adventure that presents you with an android woman, complete with vanity mirror of course, that can be raped is an absolute disgrace. Try any similar tactics on Legend's *Valhalla* and you receive a suitable reward.

Staying with Legend for a moment, their prophecy that one day we will see computer-generated movies in which we can participate and act as in real life, reinforces my point that its about time some programmers grew up and started dealing sensibly with issues such as human relationships and sexuality if they feel they really must include them in their games.

Of all the adventure games I have seen recently, *Snowball* from Level 9 wins my prize as best in the genre. Here the central character — a space age secret agent of some kind — is a woman. Whilst in *Snowball* itself the fact is largely superfluous, I understand that in later games this aspect of the character will have an influence on solving the rest of the Silicon Dream Trilogy. If this is so, how much better if the agent's sex had not been revealed.

I wonder how many hardened dragon slayers would have been completely stumped before they made the intuitive leap to realise that they were not supposed to be representing some space age macho James Bond figure.

It could have been the hardest adventure Level 9 had ever produced. ■

**Jane Stoneham**

# Puzzle

## Free lottery

**Puzzle No 93**

Following the January Sales at Pott's Department Store, there was still a large luxury hamper of food left unsold, which was to be given to one of the employees in a free draw.

Each person was invited to write his or her name on a piece of card. These cards were then stacked into a pile. The top card was taken off and discarded. Then the second card was taken from the top and placed at the bottom of the pile.

This process was then repeated until all but one card had been rejected. This card was the winner.

If there were 999 employees taking part, can you say at what position in the pile the winning card was originally at.

**Solution to Puzzle No 56**

First, we need to find all five-digit squares in which the second and fourth digits are alike, and are either 1, 9, 8 or 4.

The program checks for these by testing all squares of the numbers between 100 and 316.

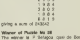
```
10 FOR N = 100 TO 316 20 LET S = N * N 30 LET S$ = STR$ S 40 IF S$(2)<>S$(4) THEN GOTO 60 50 IF S$(2) = "1" OR S$(2) = "9" OR S$(2) = "8" OR S$(2) = "4" THEN PRINT S$ 60 NEXT N
```

This reveals the following squares: 14641, 21316, 24649, 41616, 44944, 58081, 69696, 94249.

Of these, 58081 and 69696 can be entered straight away, as they are the only numbers with eights and nines. The puzzle stated that all digits except one were to be used, and as the number 7 does not occur at all, this must be the missing digit.

But the number 3 only occurs once — in the square 21316. So if we are to include this digit, 21316 must be put in the fifth column. Of the four possibilities for the last column, 94249 should be entered if the total sum of squares is to be as large as possible.

Therefore, the finished grid is:



| | | | |
|---|---|---|---|
| 2 | 6 | 5 | 9 |
| 1 | 9 | 8 | 4 |
| 3 | 6 | 0 | 2 |
| 1 | 8 | 8 | 4 |
| 6 | 8 | 1 | 9 |

giving a sum of 243342.

**Winner of Puzzle No 88**

The winner is P Belugou, quai de Bourbon, 75004 Paris, France, who receives £10.





but seriously
AUTOMATA
PIMANIA – the cult adventure
16K ZX81 £5 BBC 32K £10 Dragon 32 £10 48K £10
GROUCHO – the Piman's sequel Concord DE2
Free rock music on the flipside
48K £10
PI EYED – the comedy cartoon arcade game
48K £6
PI BALLED – A triumph of the arcade programme
Spectrum 48K £6
MORRIS MEETS THE BIKERS – as seen on TV
Spectrum £6
YAKZEE
Spectrum 48K £5
GO TO JAIL – Play the game
48K £6
THE PIMAN'S GREATEST HITS
£3
I ENCLOSE THE RIGHT MONEY, OR DEBIT MY ACCESS/VISA CARD
CARD NUMBER
MY SIGNATURE
MY NAME
MY ADDRESS
POST LOO!
NO EXTRAS! ALL OUR PRICES INCLUDE DELIVERY AND V.A.T
Send to AUTOMATA U K LTD
27 Highland Road Portsmouth Hants. PO4 9DA
THE PIMAN, HOME AGAIN, TELLS OF HIS RECENT MYSTICAL JOURNEY AFTER HIS SPELL ON THE SKIDS–AND HIS ENCOUNTER WITH EVIL SPIRITS
THEN I HAD A GIN A WHISKY A BRANDY A COINTREAU A RUM A VODKA, A B.P MULTIGRADE AND AN OLIVE, ALL IN THE SAME GLASS AND THEN I WASN'T WELL
I'M NOT A BIT SURPRISED YOU KNOW YOU SHOULDN'T HAVE OLIVES
IT WASN'T THE OLIVE THAT DID IT IT WAS THE CIGARETTE
MAKES A CHANGE FROM THE BUTLER!
THE PYRAMID! WAS IT A DREAM OR A GENUINE SPIRITUAL ENCOUNTER?!
TELL US MORE ABOUT YOUR MYSTICAL EXPERIENCE ON THE PYRAMID–I'M SURE IT'S A BASIS FOR A GREAT COMPUTER GAME!
WHO CARES AS LONG AS THERE'S MONEY IN IT?
WELL–THERE I WAS, SPRAWLED IN THE GUTTER, BOOZED OUT OF ME TREE, WHEN THIS WEIRD, ORIENTAL VOICE SPOKE TO ME–AND GUESS WHO IT TURNED OUT TO BE?
AN IRATE CHINESE TAKE-AWAY OWNER WHOSE DOORWAY YOU WERE BLOCKING!? BUY UNCLE GROUCHO AND WIN A TRIP TO HOLLYWOOD (ADVT)
(GEROFF!) IT WAS NONE OTHER THAN THAT GREAT HAIRY GURU, YAKZEE YAK–HE TRANSPORTED MY ASTRAL BODY TO A STRANGE LAND–AND IT WAS HERE I SAW THE GREAT PYRAMID OF PI!
HELLO, LITTLE PINK GUY
AHH!
HE SAID THAT TO FIND MYSELF, I HAD TO SCALE THIS GIGANTIC STRUCTURE–BUT I KEPT BUMPING INTO THIS MAD SNAKE.
AND SOME BLOKE CALLED BURT KEPT ON POPPING UP KEPT GIVING ME FILTHY LOOKS AND ACCUSED ME OF TRYING TO TRIP HIM
THEN I'D SEE HIM SAILING BY ON A FLYING SAUCER! WELL REALLY!
BUT, WORST OF ALL WERE THOSE TERRIBLE, HUGE SPHERICAL OBJECTS COMING AT ME ALL THE TIME
Evans
SPHERICAL OBJECTS? –YOU MEAN BMMMMF
YES, THANK YOU, LADY CLAIR! –LISTEN, IT'S IN THE BAG–LET'S DISCUSS IT IN THE CONFERENCE HALL
HURRY THE CLOSE AT TWO!
PENFOLD'S ROUND!
I AM NOT!
YAKZEE!!
BLESS YOU!
HARRO, DECADENT COOKIES!
COMING TO THE PUB OH, HAIRY GURU?
PIMAN NOT CALL YAK O'HARA–AND PIMAN RISTEN
NO MORE DLINKIE, SMOKIE OR SWEETIE FOR PI MAN! NO MORE LAZIE NO MORE GIRLIE! TIME NOW TO PLEPARE FOR ORYMPICS!
THOSE ARE RUDE FILMS, AREN'T THEY? HOW DARE YOU SUGGEST
NOT SKINFRICKS ORYMPICS–SPORT!!
OLYMPIC GAMES?!!
YES IT'S LEAP YEAR AGAIN GIRLS AND ALL MARRIAGE PROPOSALS WILL BE CONSIDERED! NEXT WEEK PIMAN GOES IN TRAINING